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A. NARRAINSAWMY MOODR'S.
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he university of Leipzig to study the book an active part with Gellert in the ent of a literary periodical called 'Bre-ge.' In 1741 he received an office in f taxes for the circle of Dresden, and was appointed counsellor of the court teuerrath), which office he held until March 26, 1771.

was, in his time, one of the most ters in Germany, and he exercised a cial influence upon his countrymen. show great power of observation and lisposition combined with a consider-of wit. With the exception of one, itten in prose, and were first published periodicals. A complete collection, f the author, was published in 1777,

NIGI. [CONI.]

)N. [URSIDÆ.]

IC ACID.—*Paratartaric Acid.* The of this acid is similar to that of tar-They are consequently isomeric bodies. l of racemic acid is an oblique rhombic forms insoluble salts with lime, barytes, of lead. *Biracemate of Potash* is a ing solubility. With oxide of antimony of potash forms a salt analogous to tar, which the same oxide yields with of potash; their crystalline form is ifferent. Racemic acid consists of H^2 he crystals consist of Acid[1], Water[2].

TIS. [RICKETS.]

E, JEAN, born towards the end of erté Milon, was the son of an officer of e. He studied first at Beauvais, and years spent at Port Royal des Champs, o finish his education at Paris, in the Harcourt, in 1658. On the occasion of age of Louis XIV., in 1660, his com-La Nymphe de la Seine,' was con-e best of all the poems written in that event. It was noticed by the sent to the young poet a present of or. In 1664 Racine brought out his y, 'La Thébaïde, ou les Frères Enne-ject which was suggested to him by He next wrote his 'Alexandre,' which composition. Racine, having studied ne years to improve himself, produced, s 'Andromaque,' which was acted with use. In the next year he wrote 'Les a humorous comedy in imitation of ' of Aristophanes, which was so much Louis XIV., that he bestowed upon a pension, accompanied by a very flat-. Racine now produced in succession s,' 'Bérénice,' 'Bajazet,' 'Mithridate,' and 'Phèdre,' which last is often his master-piece. Racine frequented here he had a warm friend in Madame on, and he was appointed by Louis riographer of the kingdom, together u.

' produced in 1690, was the last play He continued to visit Madame de to whom he used to read parts of his projected history of Louis XIV. This work contained some reflections upon the corrupt administration of public affairs, in the spirit of which Madame de Maintenon so much agreed, that she advised Racine to draw up a memorial upon the subject. This document, meeting the eye of the king, caused the banishment of its author from court. Very shortly after this event Racine died, April 21, 1697. Louis XIV. bestowed upon his widow a pension of 2000 livres, and the reversion of it on her sons till the death of the youngest.

His son Louis Racine published memoirs of his father's life, two volumes of commentaries on his plays, and a poem, 'La Religion,' in six cantos.

RACK. [ARRACK.]

RACK. [TORTURE.]

RADACK and RALICK are two chains of coral islands, situated in the Pacific between 5° 30′ and 12° N. lat., and between 167° and 173° E. long. The chains extend nearly N. and S., and are not much more than 100 miles from one another. Radack, the more eastern, consists of twelve groups of small islands, enclosed and connected with one another by coral reefs which rise several feet above the sea. The chain of the Ralick islands is less known, and is said to consist of nine groups and three separate islands. The islands are low, but well wooded. The inhabitants seem to belong to the Malay race, but they are said to differ in language from the inhabitants of the other islands of the Pacific. They mostly live on the produce of their orchards, and have commodiously-built houses. Their larger boats are more than 30 feet long. The sails are made of finely-braided mats, and are managed with considerable art. These islands were discovered in 1816 by Kotzebue.

RADCLIFFE, JOHN, M.D., born at Wakefield in Yorkshire, in 1650, was admitted a member of University College, Oxford, at the age of fifteen. He took his degree of M.A. in 1672, at Lincoln College, of which he was elected a fellow, and commenced the study of physic. He is represented as having 'recommended himself more by ready wit and vivacity than by any extraordinary acquisitions in learning.' In 1675 he took his degree of M.B., and began to practise as a licentiate in Oxford, where he soon acquired a great reputation. In 1682 he took the degree of M.D., and went out a Grand Compounder. In 1684 he removed to the metropolis, and settled in Bow Street, Covent Garden, where he got into great practice, to which perhaps his pleasantry and ready wit contributed as much as his reputed skill in his profession. In 1686 he was appointed by the princess Anne her principal physician, and from this time till his death he enjoyed the favour of the court, during the reigns of William and Anne, although he often offended both the king and queen by his freedoms. In 1713 he was elected into parliament for the town of Buckingham, but it does not appear that he was at all distinguished as a senator. He was sent for to attend Queen Anne when she lay at the point of death, but, being much indisposed himself, and knowing the case to be desperate, he declined going, for which he was much blamed at the

time; and it is probable that the agitation of his mind concurred with a broken constitution in bringing him to an end two months afterwards, Nov. 1, 1714.

After making a life provision for some of his relations, he bequeathed his whole fortune to public uses. To St. Bartholomew's Hospital in London he gave for ever the yearly sum of 600*l.* He left 40,000*l.* for the building of a library at Oxford. [OXFORD.] To University College he left 5000*l.* to build the master's lodge there, making one side of the eastern quadrangle. He also left them his Yorkshire estate in trust for the foundation of two Travelling Fellowships to be held by 'two persons to be chosen out of the University of Oxford, when they are M.A., and entered on the Physic line.' He bequeathed the perpetual advowson of the rectory of Headbourne Worthy, in Hampshire, to trustees for the benefit of University College for ever. He gave to the same college during his life 1100*l.* for increasing their exhibitions and for general repairs, and the painted window at the east end of their chapel appears to have been his gift. After the payment of the bequests above mentioned, he gave to his executors, in trust, all his estates in Buckinghamshire, Yorkshire, Northamptonshire, and Surrey, to be applied to such charitable purposes as they all, at their discretion, should think best; but no part thereof to their own use or benefit. Out of these funds were built the Infirmary (1770) and the Observatory (1772) at Oxford, and the Lunatic Asylum on Headington Hill near that city also received so much assistance from the same source (1827), that the committee gave it the name of the 'Radcliffe Asylum.' In 1825 the trustees gave 2000*l.* towards building the present College of Physicians in London, and they have ever been found ready to contribute according to their means to every charitable and useful purpose. Dr. Radcliffe is described as having been careless and indifferent on religious matters, and intemperate in his habits. Richardson also accuses him of avarice.

RADEMACKER, GERARD, was born at Amsterdam, in 1673. His father, an architect, placed him under A. Van Goor, a portrait-painter. Gerard afterwards spent three years at Rome, and greatly improved himself by study. On his return to Holland, he did not confine himself to architectural subjects, but painted many historical and emblematical pieces. He is reckoned one of the best masters of the Dutch School for the grandeur of his style. He died at Amsterdam, in 1711.

RADEMACKER, ABRAHAM, supposed to be a younger brother of Gerard, was born at Amsterdam, 1675, and attained a high rank as a landscape painter. He engraved a set of nearly 300 plates, from his own designs, of the most interesting views of ancient monuments in Holland and the Austrian Netherlands. They were published at Amsterdam in 1731. He died in 1735.

RADIATA. [RAYED or RADIATED ANIMALS.]

RADIATION OF HEAT is a motion of its particles in rectilinear directions, diverging every way from a heated body, either luminous or not; and it is imagined to arise from the existence of a strongly repulsive power by which the particles are made to recede from each other with great velocity.

The intensity of heat thus emitted from a point of radiation is obviously the same at equal distances from the point; and, at unequal distances, it is inversely proportional to the squares of the distances. The radiating particles falling upon the surfaces of any bodies in the vicinity of that from which they emanate, are, according to the nature of those bodies, absorbed in them, or transmitted through them, or again they may be reflected from them; and, in the two last cases, the radiant heat, as it is called, appears to suffer modifications analogous to those which, in like circumstances, take place in light.

The first direct experiments which appear to have been made on the radiation and reflection of heat are those of Mariotte, and an account of them is given in the 'Mémoires de l'Acad.,' 1682. He caused the heat of a fire to fall on the surface of a concave mirror, and observed that it was concentrated in the focus of the latter; and, on placing a plate of glass between the fire and the mirror, he perceived that the rays of heat were intercepted. Scheele in 1775 describes radiant as differing from ordinary heat by disseminating itself in right lines whose directions are not changed by the agitations of the air, and by being reflected from polished metallic mirrors, while it is absorbed in those of glass, and in the others when their surfaces are blackened.

MM. Saussure and Pictet made experiments on the radiation of heat by means of two concave mirrors. But the subject was more fully investigated by Professor (Sir John) Leslie by means of a simple and ingenious apparatus. He placed a tin canister filled with hot water in the focus of a parabolic mirror of the same metal, and a differential thermometer in the focus of another such mirror, which was placed opposite to it. The four sides of the canister were covered with the substances whose radiating powers were required. When three of the sides were covered respectively with lamp black, paper, and ground glass, and then turned so as to radiate directly on one speculum, the heat reflected by the other raised the thermometer to 100°, 98° and 90°; but when the fourth side, which was uncovered, was similarly directed, the thermometer fell to 12°. Thus it appears that polished metallic substances are bad radiators, which may be attributed to the internal reflection of the heat from their surfaces. A similar apparatus served to measure the absorptive power of different substances, the bulb of the thermometer being covered with an envelope of the substance to be examined; and this power is thus found to be nearly in proportion to that of radiation.

Professor Leslie also repeated the experiments of Pictet for determining what was called the radiation of cold; and filling his canister with ice or snow, he found that the cold apparently emitted from the varnished side was the greatest, and that from the polished side the least; he observed also that the cold, like the radiant heat, varied with

changes in the absorbent power of the thermometer and of the surface of the mirror. These circumstances, which seemed at one time to favour the opinion that cold had a material existence like heat, have received an explanation from M. Prevost of Geneva. ('Journal de Physique,' xxxviii.) This philosopher observes that a mass of ice or snow may send out radiant heat less in abundance than that which is emitted from other bodies in its vicinity; and this comparatively small quantity of heat, when reflected from one mirror to the other, and from the surface of the latter to the focus, may there produce the effect of absolute cold, by causing the thermometer to send out radiant heat to the ice, and thus render the mercury in it lower than it would otherwise be.

Experiments made by Count Rumford, soon after the publication of Leslie's work, produced nearly the same results as the latter had obtained; and the Count draws from them several useful conclusions. He observes ('Phil. Trans.,' 1804), that if we would confine heated substances, solid or fluid, in a vessel, the surface of the latter should be highly polished; on the other hand, if the object be to cool the substances, the surface should be painted or varnished, or be covered with a soft coating which is not metallic. Also, in warming apartments by steam, the intention being to promote radiation as much as possible, the tubes conveying the steam should be unpolished or painted.

That the colours of bodies have some effect on the velocity of radiation and on the absorption of heat, has been proved by experiments made by Dr. Stark of Edinburgh (1833). This gentleman surrounded the bulb of a thermometer successively with equal weights of black, red, and white wool, and placed it in a glass tube, which was heated to the temperature of 180° by immersion in hot water; the tube was then cooled down to 50° by immersion in cold water, and the several times of cooling were respectively 21, 26, and 27 minutes.

The subject of the refrangibility of radiant heat was first examined by Sir William Herschel, who, having analysed by the prism, as usual, a beam of solar light, and having placed a Fahrenheit's thermometer successively within the fields of the different coloured rays in the spectrum, found that in the violet rays the temperature was 2°, and, gradually increasing towards the other extremity, in the red rays it was 7° above the general temperature of the apartment. He also ascertained that there was a point beyond the limits of the visible red rays at which the excess of temperature was a maximum. Similar observations were made about the same time by Sir Henry Englefield; and it was hence evident not only that the calorific rays were refrangible, but that the property existed in them in a higher degree than in light.

The subject of solar radiation, or of the direct force of the sun's rays has been treated by Mr. Daniell, in his 'Meteorological Essays,' 1823. That gentleman observed that the power of solar radiation varies with the sun's declination; the greatest intensity taking place in June, though the greatest mean temperature of the atmosphere does not occur till July. He observed also that the radiation varies at different hours of the day, increasing with the sun's altitude till a short time after it arrives on the meridian, and then diminishing till the evening. From the observations of Captain (now Colonel) Sabine at Sierra Leone, at Bahia, and at Port Royal, Mr. Daniell has been led to conclude that the intensity of solar radiation diminishes in proceeding towards the equator.

Since all bodies, even in vacuo, lose heat by radiation, it is easy to conceive that any part of the earth's surface, when not exposed to the direct action of the sun, must emit calorific rays of heat towards the heavens, and thus must become cooled. This is called *terrestrial radiation*, and the subject has been particularly considered by Mr. Daniell, who, from observations continued during all the months of the year, found that the maximum depression of the thermometer, on account of radiation, varied from 10° to 17° between midwinter and midsummer.

RADIOLA, a genus of plants belonging to the natural order *Lineæ*. *R. milligrana* is the only species of this genus. It is the *R. linoides* of some botanists, and is a British plant.

RADISH. [RAPHANUS.]

RA'DIUS (a ray, the spoke of a wheel) means the line drawn from a point, considered as a centre or pole, to any point of a curve.

RADIX (root) is applied to any number which is arbitrarily made the fundamental number of any system. Thus ten is the radix of the decimal system of numeration, and the radix of the common system of logarithms. The term however has not acquired much fixed use, though often convenient for temporary specification of the use which is made of a particular number or fraction.

RADNORSHIRE, a county of South Wales, lies between 52° 2′ and 52° 28′ N. lat., 2° 57′ and 3° 45′ W. long. This county is of an irregular form, bounded N. by Montgomeryshire and Shropshire, E. and S.E. by Herefordshire, S. and S.W. by Brecknockshire, and W. by Cardiganshire. Its greatest length E. to W. is 31 miles. Its greatest breadth N. to S. is 26 miles. The area is 426 square miles. The population in 1841 was 25,356.

Surface, Hydrography, &c.—Radnorshire is a mountainous county. The highest range is that of Radnor Forest, one portion of which attains the height of 2163 feet above the level of the sea. The wild tract of land called Radnor Forest, which is on the eastern side of the county, produces nothing but moss and heath. There are some hills of considerable height in other parts of Radnorshire.

The general direction of the rivers and streams is to the south-east; and nearly all of them empty themselves into the Wye and its tributaries.

The Wye enters Radnorshire on the N.W., at a distance of about 18 miles from its source on Plynlimmon. After passing Rhayader it flows S.S.E. and then E., separating Radnorshire from Brecknockshire, after which it flows N. for a short distance by the side of Herefordshire, into which county it enters. The Elan enters the Wye on the right bank a short distance below the town

of Rhayader. The Ithon flows S., and drains the central portion of the county; and before its junction with the Wye, on the left bank of that river, 7 miles above the town of Builth, it becomes a stream of considerable size, having a course of 30 miles. The Elan and Ithon are the only two rivers which exclusively belong to Radnorshire. The Lug and the Teme have a part of their course in Radnorshire. The smaller streams are the Somergel, Edw, Marteg, Clywedog, Arrow, and Bachwy. There are a few lakes, but they are all small.

Geological Structure.—The principal portion of the county is composed of the strata forming the Silurian system; but on the west and north-west side of the county, the upper beds of the older rocks, composing the Cambrian system, make their appearance. These rocks comprise perhaps one-fourth of the whole county, having in their extreme western and north-western limits a slaty character, which towards the interior or east is gradually changed to quartzose grit. The river Ithon forms nearly exactly the line of junction of the Cambrian rocks with those of the Silurian system; the latter however encroach somewhat on the west of the Ithon as that river approaches the Wye.

Though all the strata of the county are inferior to the carboniferous rocks, yet many attempts have been made in search of coal, which the majority of the inhabitants believe to exist under the surface. The principal cause of this delusion has been the dark lead-coloured appearance of the shale in the neighbourhood of the trap-rocks; and accordingly, where the trap-rocks protrude, levels have been driven and shafts sunk, while a slight acquaintance with the principles of geological science would show such attempts to be utterly hopeless.

Soil and Agriculture.—A great portion of the county consists of common-land, bogs, and moorland, and is therefore comparatively useless for agricultural purposes. It is supposed that nearly two-thirds of the county are uninclosed, though a large part merely requires to be inclosed to render it fit for profitable cultivation, while other portions, too steep or too exposed for agricultural purposes, might be successfully planted. The proportion of waste land however has been greatly diminished of late, as inclosures are gradually making, as well as considerable plantations of larch and fir. The waste lands however, even in their uncultivated state, are of great value as sheep-walks. Notwithstanding the thin population of this county, the quantity of wheat grown is considerably less than the consumption. Barley and oats are grown in considerable quantities on nearly all the farms. Potatoes are cultivated to some extent, and flax in small patches for home use. For purposes of sale, the main dependence of the Radnorshire farmer is on the stock reared on the pasture-land and common-land, which not only support large quantities of sheep, but, in the most sheltered parts, cattle of all sorts. The cows are principally of the Herefordshire breed. Numbers of Welsh ponies are also reared on the commons. A scarcity of manure retards the improvement of the land. The farms are of various sizes; but it may be observed that the homesteads on the largest are generally much inferior to those of Herefordshire and other English counties.

Divisions and Towns.—Radnorshire is divided into 6 hundreds. It is in the dioceses of Hereford and St. David's. It is in the South Wales circuit, and the assizes are held at Presteign. The county returns one member to parliament, and one member is returned for the borough of New Radnor, in conjunction with Presteign, Knighton, Rhayader, Kefn Llys, and Kunklas.

The following are the principal towns, with the population of each in 1841 :—

Knighton, a market town and a borough contributory to New Radnor, is 10 miles N.E. from that town, on the borders of Shropshire, from which it is separated by the river Teme. The Welsh name is Tref-y-clawdd, which signifies 'the town upon the dyke,' Offa's Dyke running close to the town. The town is awkwardly situated, being built on the side of a steep hill. Population of the borough, 1183.

New Radnor, or Maes-yfed Newydd, formerly the capital of the county, but now degenerated into a village, is about 9 miles W.S.W. from Presteign. Its present condition may be ascribed, first to its ceasing to be kept fortified and garrisoned as a frontier town, its proximity to Presteign and Kington, and its cold situation and the scarcity of fuel. The parliamentary borough of New Radnor, in conjunction with the contributory boroughs, returns one member to parliament. Population of the borough, 2498. Total population, including the contributory boroughs, 6419.

Old Radnor, or Maes-yfed Hen, called also Pen-y-Craig, or 'the summit of a rock,' stands on an elevated situation, about two miles S.E. from New Radnor. The church is prettily situated, and contains a curiously-carved wooden screen. Population of the township, 241.

Presteign, the capital of the county, and a borough contributory to New Radnor, is about 9 miles E.N.E. from that town, and 151 miles from London by the road. Presteign, which stands in a fertile valley, watered by the Lug, is supposed to owe its rise to Martin, bishop of St. David's, in the 13th century. It now consists of four principal streets. The assizes and quarter-sessions are held here. The shire-hall and county-gaol are modern buildings. The public walks, called Warden, are situated on an eminence, N.W. of the town. The ground was presented to the inhabitants by the Earl of Oxford. Population of the contributory borough, 1550.

Rhayader, a market town, is on the banks of the river Wye, 28 miles W. by N. from Presteign. Before the present bridge of one large arch was erected, there was a considerable fall of water, but the channel was then deepened and cleared. The town is dirty in its appearance. The manufacture of flannel and coarse cloth is carried on, but on a very small scale. Population of the contributory borough, 6419.

History and Antiquities.—Radnorshire originally formed part of the territory inhabited by

the Silures. After its subjugation and ultimate abandonment by the Romans, it was included in one of the petty principalities into which Wales was divided, and the history of Radnorshire is naturally merged in that of Wales. After the Norman Conquest, it became the prey of the Norman adventurers who obtained a settlement in Herefordshire and Brecknockshire. In the reign of Henry VIII. Radnor was formed into a county.

Offa's Dyke, the boundary formed by Offa between his kingdom of Mercia and the territories of the Welsh princes, enters Radnorshire on the north at Knighton, and, running south, enters Herefordshire at Berva Bank, a steep hill on the right of the turnpike-road between Presteign and New Radnor.

The only monastic establishment in Radnorshire seems to have been that of Abbey Cwm Hir, or the Abbey of the White Monks. It is romantically situated in a narrow valley surrounded by high hills in the N.W. portion of the county, to the left of the road leading from Llandewy to Newtown.

RAEBURN, SIR HENRY, the son of a manufacturer at Stockbridge, Edinburgh, was born there March 4, 1756. He was apprenticed to a goldsmith; but he early manifested a talent for art, and, altogether untaught, painted numerous miniatures, which he turned to profitable account.

At the expiration of his apprenticeship, he became a portrait-painter, and gained very extensive practice. In 1787 he returned from a two years' tour in Italy, and established himself in Edinburgh. He was elected a member of the Royal Society of that city, and of the Imperial Academy of Florence. In 1815 he was made a Royal Academician. On the visit of George IV. to Scotland in 1822, Raeburn was knighted at Hopetoun House, and in the summer of the following year he was appointed portrait-painter to the king for Scotland, an honour which he did not long enjoy. He died July 8, 1823.

RAFFAELLE. [RAPHAEL.]

RAFFLES, SIR THOMAS STAMFORD, the son of a captain in the West India trade, was born at sea, off Jamaica, July 5, 1781. At the age of 15 he was placed as an assistant clerk in the India House. In this situation he showed much talent and industry, and in 1805 was appointed under-secretary to the new government formed by the East India Company at Pulo-Penang, or Prince of Wales' Island. His acquirements in the Malay and other eastern languages, which he zealously studied, rendered him so useful to the Government that he was soon appointed chief secretary.

In 1809 he published his first literary essay, 'On the Malay Nation.' The expedition against Batavia, in 1811, having been proposed by Raffles, and successfully carried out by the British government, he was appointed 'Lieutenant-Governor of Java and its dependencies.' In his administration he evinced great energy of character, but he became an object of jealousy to some of his colleagues, and a number of charges were consequently brought against him, which led to his recall in 1816. On his return to England, he published his 'History of Java,' 2 vols. 4to.

In 1818 he was appointed lieutenant-governor of Fort Marlborough, the seat of the English government at Bencoolen, on the island of Sumatra, and again returned to India, having first received the honour of knighthood. He remained at Bencoolen six years, during which time he effected many improvements. He emancipated the slaves there, as he had done in Java. He established a British settlement at Singapore, and founded a college there for the encouragement of Anglo-Chinese and Malay literature. In 1820 he sent home a large collection of preserved animals, which are now in the Museum of the London Zoological Society. Ill health compelled him to return to England in 1824. In consequence of a fire on board the ship, by which Sir Stamford was about to sail, he lost the greatest part of his extensive collection of animals and plants, as well as many volumes of manuscripts and drawings relative to the civil and natural history of nearly every island in the Malayan Archipelago; besides this, which might be considered as a public loss, his own pecuniary loss amounted to upwards of 20,000*l*.

After his return to England he founded the present Zoological Society, of which he was the first president. He died in 1826. He left several manuscripts behind him.

RAFFLE'SIA is the name of a plant found in the hot damp jungle of Sumatra, growing parasitically on a kind of vine, and discovered by the late Sir T. S. Raffles, whose name it bears.

RAGMAN'S ROLL, the uncouth name of the collection of those instruments by which the nobility and gentry of Scotland were constrained to subscribe allegiance to Edward I. of England in 1296, and which were more particularly recorded in four large rolls of parchment, consisting of thirty-five pieces sewed together, kept in the Tower of London. These instruments are for the most part extant in the third volume of Prynne's 'Records,' from p. 648 to 665, and have been more correctly printed under the auspices of the Bannatyne Club ('Instrumenta Publica, sive Processus super Fidelitatibus et Homagiis Scotorum Domino Regi Angliæ factis A.D. MCCXCI—MCCXCVI,' 4to., Edinb., 1834). These records contain the largest and most authentic enumeration now extant of the nobility, barons, landholders, and burgesses, as well as of the clergy of Scotland, prior to the 14th century.

The meaning of the word *ragman* has given much trouble to etymologists; from other instruments and records however it seems clear that in diplomatic language the term ragman imports an indenture or other legal deed executed under the seals of the parties; and consequently that its application to the Rolls here in question implies that they are the record of the separate ragmans, or sealed instruments of homage and fealty, executed by the people of Scotland.

RAGUSA. [DALMATIA.]

RAHMEN, ABD-EL-. [ABBASIDES.]

RAIA, a genus of cartilaginous fishes, established by Linnæus, and since much subdivided

by ichthyologists. The rays differ from the sharks in being horizontally flattened, so that their bodies with their broad and fleshy pectoral fins resemble large expanded disks. The eyes and spiracles are placed above the mouth, nostrils and bronchial orifices below. The dorsal fins spring from the tail. The Common Skate and the Ray are familiar examples.

The following are the principal sub-genera into which *Raia* has been divided:—

Torpedo. Rays with short and rather thick tails, and having the disk of their bodies nearly circular. Their teeth are small and sharp. The torpedos are remarkable for the electrical apparatus with which they are provided; it is seated in the part between the pectorals, head, and branchiæ. Fishes of this genus are rare in the British seas, but common on the coasts of southern Europe.

Raia. The tail of the typical Rays is slender, and bears two small dorsal fins towards the extremity, with sometimes an imperfect caudal fin. The mouth is armed with slender thickly-set teeth arranged in quincuncial order.

Trygon. The Sting-Rays, which have a slender finless tail armed with a sharp serrated spine, by which the fish can inflict severe wounds; hence its popular name.

Myliobatis. Tail very long, armed, and bearing a small dorsal fin; head projecting from between the pectorals, which are very broad. Teeth flat, and arranged like stones in a pavement. The Whip-Ray belongs to this sub-genus.

Cephaloptera. Tail armed, and bearing a small dorsal, but the head is curiously truncated, and is placed between two horn-like processes of the broad pectoral fins, giving the creature a very extraordinary and incomplete or mutilated aspect. The teeth are small and very slender.

RAIL. [RALLIDÆ.]

RAILWAY. Railways have been used for a considerable time as a means of transport for minerals and heavy goods; and during the last twenty years, in conjunction with locomotive steam-engines, have been introduced to a very important extent for the purposes of general conveyance.

History.—In the early part of the 17th century, wooden rail-, tram-, or waggon-ways were introduced in the collieries of the north of England. They were adopted in order to reduce the labour of drawing coals from the pits to the places of shipment in the neighbourhood of Newcastle-upon-Tyne, and they consisted, in the first instance, simply of pieces of wood imbedded in the ordinary road, in such a manner as to form wheel-tracks for the carts or waggons employed. An improved form was the following:—The road was prepared by being levelled, or reduced to as uniform an inclination as circumstances would allow; pieces of wood, roughly squared, about six feet long and four to eight inches square, were then laid across it at a distance of about two or three feet from each other, and upon these other pieces, carefully sawn, about six or seven inches wide and five deep, were fastened by means of pegs, in such a manner as to form two wheel-tracks, about four feet apart.

The vehicles used upon these wooden railways were generally waggons, containing from two to three tons of coal, mounted upon small wheels. The wheels were provided with a flange, or projecting rim, which, by coming in contact with the side of the rail, retained the waggon upon the railroad.

It was not till 1767, after many minor improvements, that iron plates were laid upon the wooden rails: this was done on a railway at the Colebrook Dale iron works. Some time after the experiment at Colebrook Dale, cast-iron rails, with an upright flange, were brought into use at the colliery of the Duke of Norfolk, near Sheffield, in 1776. Originally they were fixed upon cross sleepers of wood, like those used to support wooden rails. About the year 1793 blocks of stone were introduced as supports, instead of the wooden sleepers. They were, in the early railways, about a foot square, and eight or nine inches deep. One of these blocks is imbedded in the road under each joint in the rails, which are spiked down to wooden plugs inserted in the stone.

Various inconveniences attendant on these Plate-Railways led to the use of Edge-Railways, which have now almost entirely superseded the previous form. The first edge-railway of any considerable extent was completed in 1801 for the conveyance of slate from the quarries of Lord Penrhyn. The decided advantages of edge-rails were so well appreciated by the coal-owners of Northumberland and Durham, that they were adopted extensively by them within a few years after the successful experiment at Penrhyn. Many successive varieties have been introduced in the form of the rails. Since the general introduction of locomotive engines the use of pins has been abandoned, as they have a tendency to work loose, and wedges or keys, which may be tightened when necessary, have been applied in different ways in their stead. From the commencement of the use of iron railways much inconvenience was caused by the frequent breakage of the rails, especially those of the tram-plate form. The desire to introduce a more durable rail led to experiments on the combination of wrought and cast iron; but these and all similar contrivances were superseded in 1820 by Mr. Birkenshaw's invention of an efficient and cheap method of rolling iron bars suitable for rails and other purposes. The fibrous texture of wrought-iron makes it far less likely to break when subjected to concussion than cast-iron, and the sectional form used is such as to render bending improbable.

In the infancy of railways animal power was the only means of locomotion employed to any considerable extent; but the purpose to which they were applied, that of conveying mineral produce to a place of shipment, naturally led to the application of gravity as an auxiliary, and, in some cases, as the sole source of motion. Where, in such a case, the inclination of the ground is very moderate, the slope of the road is frequently so adjusted that no greater power is required to take a loaded carriage down, than to take it up again when empty. When a declivity occurs steeper

than is convenient for the ordinary power, an ingenious arrangement, called a *self-acting inclined plane* is occasionally resorted to, on which a loaded carriage, or a train of carriages, is allowed to run down by the force of gravity, drawing a rope, which, after passing round a wheel at the top of the incline, is conducted down the slope and attached to an empty train—the force of the descent of the loaded vehicles being sufficient to cause the empty train to run up to the top of the plane.

The possibility of applying the steam-engine to the purposes of locomotion was conceived by several of its earliest improvers, and in 1784 a plan was suggested in one of the patents of Watt; but it does not appear that either he or any other inventor carried their ideas into practice until about 1802, when Messrs. Trevithick and Vivian patented a high-pressure engine, which, by its simplicity and compactness, was admirably adapted for locomotive purposes. Within a few years they built several carriages, one of which, at least, was for use on a common road. In 1805 they made some interesting experiments with a locomotive on a tramway near Merthyr Tydvil, and thereby proved the practicability of their plan. It is remarkable that, notwithstanding the extreme simplicity of this machine, it possessed almost all the essential arrangements of the modern engines.

Trevithick was aware that, although the adhesion between the engine-wheels and the rails was sufficient to ensure the progressive motion of his machine on a level or nearly level road, the wheels would slip round without advancing if the inclination were considerable or the load attached too great. He therefore in his patent proposed to remedy this by making the propelling wheels uneven by the projecting heads of bolts, cross-grooves, or fittings to railroads, where the adhesion of the plain wheels should prove insufficient. Numerous plans were successfully advocated by Blackinsop, Chapman, Brunton, Gordon, Gurney, and others, to increase the adhesion or *bite* of the wheel to the rail; but it has since been found that such aids are for the most part unnecessary.

When the projectors of the Liverpool and Manchester Railway were engaged in the design and execution of that great work, in 1825 and the following years, they were soon convinced that horse-power was ineligible, as it was intended to aim at considerable velocity, and the expense of animal power, when applied at a speed of eight or ten miles per hour, is very great. It was not so easy to decide on the comparative merits of stationary and locomotive engines. Various suggestions were made for the application of fixed engines at intervals of a mile or two along the line to draw trains by ropes from station to station; but it was eventually determined to use locomotives, and to offer a premium of 500*l.* for the best to be produced which would fulfil certain conditions, of which some were that it should not emit smoke, should draw three times its own weight at the rate of ten miles per hour, should be supported on springs, not exceed six tons weight, or four tons and a half if on only four wheels, and should not cost more than 550*l.* The trial was fixed for October, 1829, when four steam locomotives were produced, one of which was withdrawn at the commencement of the experiment. Of the other three, the Novelty, by Messrs. Braithwaite and Ericson, and the Sans Pareil, by Mr. Hackworth, failed in some of the conditions. The remaining engine, the Rocket, was constructed by Robert Stephenson and Mr. Booth, of the Liverpool and Manchester Railway, and succeeded in performing more than was stipulated for. The most marked improvement in Stephenson's locomotive was the use of a tubular boiler instead of a large flue.

Railway Legislation.—Railways being in this country constructed by associations of private individuals, with a view to their own pecuniary advantage, as well as to public convenience, it is necessary that, on the one hand, legislative restrictions should be imposed, to protect the interests of those who may, directly or indirectly, be affected by the formation of the railway; and, on the other, that the promoters of the scheme should be invested with considerable powers to enable them to carry it into effect. Lands, buildings, rivers, canals, roads, &c., have to be intersected and otherwise interfered with; and while justice requires that no unnecessary injury should be inflicted on their owners, or the parties using them, and that every unavoidable interference should be amply paid for, it is also necessary to prevent a plan likely to be of great public benefit from being defeated by objections arising from prejudice or private interest. Hence it arises that special acts of parliament are requisite for all railway companies.

The parties who have planned a railway obtain subscriptions to the undertaking; and having made the necessary surveys, they determine to apply for an act of parliament to incorporate a company for executing the works, and to give them the powers required for that purpose. The parliamentary proceedings in respect to such applications have undergone many changes within the last few years. Few means were at first taken by parliament to inquire whether the line was the best that could have been suggested for the district through which it was intended to pass; but the evidence adduced by the promoters was held to establish the public utility of the undertaking, and it was authorised. The executive government took no part in the investigation; and parliamentary committees, composed of members locally interested, can scarcely be said to have inquired into the merits of lines, except when an inquiry was forced upon them by the opposition of private parties. In 1839 the constitution of the committees was improved by the admixture of 'selected members,' who were not locally interested; and since 1844, the committees have been composed exclusively of members who have had no local interest in the lines referred to their consideration.

The first step towards a control of railways by the government was taken in 1840, when an act was passed to place them under the supervision of the Board of Trade. By that act (3 Vict., c. 97), and by a subsequent act (5 & 6 Vict., c 55) power was given to the Board of Trade to postpone the opening of any railway not considered safe

by their inspectors, and to exercise a more enlarged control over such matters as were deemed of importance to the public. The provisions of these acts were mainly directed to the ensuring of the public safety; but in 1844 a more important act (7 & 8 Vict. c. 85) was passed, with a view to secure the interests of the public from being sacrificed to the independent privileges granted by parliament, in perpetuity, to railway companies. The running one third-class passenger-train, once a day at least, and at a fare not exceeding 1*d*. per mile to each passenger, also mail-service, conveyance of troops, facilities for a government electric telegraph, and a government inspection of railways, were among the matters treated in this act.

The experience of railway companies who had applied to parliament, from time to time, for powers to make and maintain their lines had suggested various clauses which were usually adopted in all railway bills; and there was at the same time a necessity of repeating in every railway act the same multitudinous enactments. To ensure brevity and uniformity in these matters, several acts were passed in the session of 1845, which are now commonly called the 'Consolidation Acts.' They were the 'Companies' Clauses,' the 'Lands' Clauses,' and the 'Railways' Clauses Consolidation Acts.' The 'Joint Stock Companies' Act of 1844 (7 & 8 Vict. c. 110) determined the liabilities to which the shareholders in a railway or other company bound themselves.

In the session of 1846 several acts were passed affecting railways. By one of these acts Commissioners of Railways were constituted, to whom all the powers of the Board of Trade, in respect to railways, have been transferred. By two other acts (9 & 10 Vict. c. 62 and c. 93) the ancient law of deodands is abolished; and where death has been caused by accident, compensation to the relatives of the deceased may be obtained by an action for damages.

Preparatory Works for a Line of Railway.—When the termini and general course of a line of railway are determined on, there remain many points to be considered in selecting the precise direction which it shall take. It is necessary carefully to examine the country to be passed over—its elevations and depressions—its rivers, canals, roads, and all other streams of water or means of communication that have to be crossed, or in any way interfered with—and its geological structure; any of which may occasionally render a deviation from the direct course advisable.

It is evident that, as a general rule, a perfectly straight and level line is to be preferred, when the termini are of equal elevation; or a uniform slope when one is higher than the other. But, desirable as a perfect level or uniform slope may be, it rarely happens that either can be attained for any great distance without involving such a deviation from the natural surface of the ground as would be very inconvenient. The engineer therefore so adjusts his inclinations or *gradients* as to make the nearest practicable approach to a level, avoiding if possible any loss of power from undulations of surface, by making all the inclinations on one side of the summit, or highest point to be passed over, rise towards it, and all on the opposite side descend from it. In order to the due adjustment of the gradients, a section or profile of the line of country is prepared, in which the elevations and depressions are drawn to a much larger scale than the horizontal distances, in order that, by being made disproportionately steep, they may be more readily recognised by the eye. The experience of engineers has led them gradually to adopt as equable a range of gradients as may be practicable, instead of an alternation of dead levels and steep gradients.

Curves on a main line of railway being objectionable, a judicious engineer so adjusts his line as to avoid them when possible, and to make those which are inevitable of as large a radius as circumstances will admit. Curves of less than a mile radius are considered unadvisable for places where great velocity is required, although many of only half a mile radius are in use.

It is essential to the public safety that a railway should not be allowed to cross any much-frequented road on the same level; and in order to avoid such crossings, many viaducts, bridges, tunnels, &c., are rendered necessary. Most level crossings are on small roads; and where a larger road is so crossed, great attention is paid to provide efficient gates and gatekeepers.

Works of Construction.—Under this head is included the execution of those works necessary for the formation of a railway (independent of the rails and finishing works), of the required level and width. These works consist of tunneling, excavation, embankment, and masonry for bridges, viaducts, and other erections. They are commonly divided into convenient portions, and let to contractors under agreement to complete them at a stipulated price and within a specified time. It is usual to commence with those works which take the longest time, that the capital expended on others may not lie idle till they are completed.

Tunnels are, in general, the most formidable works, and the time and expense of forming them can be least accurately calculated, because unforeseen circumstances often arise to retard their progress. Being objectionable also on other accounts, tunnels are avoided as much as possible in the more recently-designed railways.

Cuttings or excavations of great depth and extent are of frequent occurrence where the railway passes through high ground, but not at such a depth from the surface as to require a tunnel. The depth of cuttings is frequently from fifty to a hundred feet. The degree of slope necessary in the sides of cuttings varies greatly in different soils. Rock will stand when nearly vertical; chalk varies from nearly vertical to a slope of one horizontal to one vertical, or an angle of 45°; gravel stands usually at one and a half to one; London clay from one to one to three to one. Some materials require even a greater slope.

Embankments are the artificial ridges of earth formed to support the railway on a higher level than the natural surface of the ground. Their dimensions are often fully commensurate with those of cuttings, from which their materials are

mostly procured. In the ordinary mode of proceeding, an embankment is formed simultaneously with a cutting, the earth-waggons proceeding filled from the excavation along a temporary railway to the embankment, where they are tipped up to discharge their contents. The sides of embankments, like those of cuttings, require a considerable slope, especially when the material is of an unfavourable nature.

The amount of masonry and brickwork required in the various erections of a railway is very great. Arching of almost every kind is more or less required in viaducts, bridges, culverts, and drains; and simpler work in the retaining walls, station-buildings, and other necessary erections. Viaducts of great magnitude are often executed for the purpose of crossing valleys at an elevation greater than could be conveniently obtained by embankment, and also for entering or passing through towns. They are usually of stone or brick, but sometimes of wood or iron.

Bridges are required occasionally for crossing rivers, and very frequently at the intersection of roads, and as communications between severed property. They are formed of stone, brick, wood, iron, or combinations of two or more of these. Skew-Bridges (oblique bridges) are occasionally required.

The level of the earth-works, when completed, is called the *formation-level*, and is usually about two feet below the intended surface of the rails. The width of this surface is about thirty feet, exclusive of the drains and fences, and it is made a few inches higher in the middle than at the sides, in order to throw off water.

Permanent Way, Sleepers, Chairs, Rails, &c.—In order to obtain a firm dry foundation for the blocks or sleepers, a layer or stratum of broken stone, technically called *ballast*, is spread over the road to the thickness of a foot or more, varying according to the construction adopted and other circumstances. After the rails are laid down, similar materials are used to fill in the spaces between the blocks and sleepers.

The most common method of fixing the rails has been to fit them into iron chairs, which are spiked down to blocks of stone imbedded in the ballasting; but experience has shown that cross-sleepers are better than stone blocks for this purpose. In such an arrangement, the rail is sustained only at intervals of three or four feet, the intervening portion acting as a bridge, which, though very rigid, yields in a slight degree when carriages, and particularly the heavy locomotive engines, pass over it. In some railways, especially those on the broad gauge, the rails are laid on continuous timber bearings throughout. The chairs, or metallic fastenings beneath the rails, have varied in form according to the form of the rail and the nature of the bearings.

The kind of rail now most commonly employed, is variously called the I, the H, and the double-T-rail; and the weight is seldom less than 70 or 75 lbs. per yard. Some have been used as heavy as 90 lbs. per yard. Though continuous timber bearings are still preferred by some engineers, they have been gradually losing favour, and transverse wooden sleepers, which were formerly regarded rather as temporary substitutes for stone blocks than as a permanent means of support for the rails, have been brought into very extensive use.

The *gauge*, or width between the two rails forming a track, is one of the points in railway practice which has excited much discussion. On the old railways it was of little consequence, provided a good horsepath could be ensured without interfering with the rails. Four feet was not an uncommon width, but many lines were less. Some of the colliery railways in Northumberland are four feet eight inches and a half, and from these the Stockton and Darlington, Liverpool and Manchester, and other lines, took their gauge. The advantage of uniformity has led most companies to follow this example. The ordinary width being considered by him inconveniently limited, Mr. Brunel fixed upon seven feet as the gauge of the Great Western and its tributary lines. Much opposition was made to this bold step, mainly on account of the inconvenience of not being able to connect with other lines. The superiority of this enlarged gauge is apparent in the increased power and speed of the engines, and the stability and convenience of the carriages; but many who admit the inconvenience of the narrow gauge, consider seven feet to be beyond the most advantageous width. Six feet two inches has been recommended by the Irish Railway Commissioners. Gauges of six feet, of five feet six inches, and of five feet, were adopted in some of the English lines; but all the English and Scotch companies have now adopted the gauge of four feet eight and a half inches, except those connected with the Great Western Company.

The width between the two tracks is a matter of much less consequence, as it has little effect except in limiting the width of load that may be carried: it varies from five to twelve feet.

One of the most important points connected with the break of gauge, is the interference which it would necessarily produce in the Clearing-House system. No sooner had the railways which extend from London to Liverpool been completed in 1838, than it became evident that arrangements must be adopted to facilitate the passage of the through-traffic, so that passengers might perform any journey within the limits to which continuous communication by railway extended, without being required to change their carriage; and that a similar principle must pervade the arrangements for working every description of through-traffic if the public were to be conciliated, and the resources of the railway-system developed to their full extent. For some time however dissensions and difficulties arose between the different companies. Under these circumstances it occurred both to Mr. Robert Stephenson and to Mr. K. Morrison, that a remedy might be found in the establishment of a central office on the principle of the Clearing-House, by which the business of the London bankers is so materially facilitated. After some difficulties the proposed system was, on the 2nd of January, 1842, brought into partial operation; and has since extended to

nearly all the narrow-gauge railways. The principle of the system is, that passengers shall be booked through at all principal stations, and conveyed to their destination without change of carriage; that horses and cattle be in like way carried through without change of conveyance, and goods without being shifted or re-assorted; that the companies respectively shall pay a fixed rate per mile for such carriages and waggons, not their own property, as they may use, and a further sum per day by way of fine or demurrage for detention, if kept beyond a prescribed length of time; and that all traffic accounts between the several companies shall pass through the Clearing-House.

The locomotive engines and railway carriages have the wheel-tires slightly conical, in order that the flanges may come in contact with the rails as little as possible. In ordinary wheels three inches and a half wide, the inclination of the tire is about 1 in 7, the diameter at the outside being an inch less than close to the flange. The wheels are so fixed that when running straight the flanges are about an inch from the rails. When the line is curved, it is usual to lay the outer rail of the curve rather higher than the inner one, that the opposing forces may be so balanced as to cause average loads to pass round the curve without the flanges on either side coming in contact with the rails.

The Switches, Sidings, Turn-Tables, and other similar mechanism of a railway, however important in practice, do not call for description here. The Signal-Lights, Flags, and other analogous contrivances, have called forth much ingenuity.

Carriages.—Railway carriages for the conveyance of passengers are usually very capacious, the bodies being made to project over the wheels, which on ordinary lines seldom exceed three feet diameter. This arrangement is not productive of danger, since the evenness of a railway, the comparatively low build of the carriages, and the great weight of the iron wheels, axles, and framing under the body, prevent the liability of overturning. On account of the rapid speed at which they travel, and the violent shocks to which they are occasionally subject, great strength of construction is necessary; and the circumstance of several vehicles being linked together in one train renders the use of an elastic apparatus for starting and stopping them essential, both for the safety and comfort of passengers, and the protection of the vehicles themselves. Elasticity in the traction is also necessary, in order that the engine may not have to overcome the inertia of the whole train at the same instant, which would require much more power than suffices, when they are started, to keep the whole in motion. Various contrivances, more or less complete and effective, are in use for this purpose. While the most modern English railway carriages are more elegant in appearance than those of older build, they are both more roomy and stronger in the frame-work, which, in some of the most recently constructed, is made of wrought-iron; experience having shown that light carriages would not bear the strains to which they are exposed.

Locomotive Engines.—Since the successful adoption of locomotive steam-engines on the Liverpool and Manchester Railway, improvements have followed closely upon one another, but they have been chiefly of a minor character, when compared with that of tubing the boiler, which formed the distinguishing feature of the Rocket engine. Stephenson built several engines shortly after the competition in which the Rocket had proved victorious, retaining this arrangement, but having the machinery disposed in a different manner.

The tubes through the boiler, for the passage of flame and heated air, are now always made of brass, which is found much more durable than copper. They vary in number in different engines from about ninety to a hundred and fifty or upwards, being frequently less than an inch and a half in diameter. The power of generating steam, which is the measure of efficiency in a locomotive engine, depends much upon judicious tubing, it being desirable to deprive the heated air of its caloric as completely as possible before leaving the boiler. Boilers are frequently tubed to such an extent that from four to six hundred square feet of heated metal is exposed to the water, in addition to the area of the fire-box itself. An important feature in a locomotive boiler is its security from bursting, because, as the tubes are much weaker than the external casing of the boiler, they are almost certain to give way first, and the bursting of one or two tubes is rarely productive of more serious consequence than extinguishing the fire, and thereby causing a gradual stoppage of the machine.

Among the results consequent upon the use of comparatively steep gradients, coupled with the great increase of railway traffic, and the growing demand for increased speed, is a general enlargement of the locomotive engine. The necessity for increased power, calling for the use of larger boilers and cylinders, is leading to the very general abandonment of that construction of engine in which the cylinders are placed at the bottom of the smoke-box, and the machinery is under the boiler; and a growing preference for those in which the cylinders are fixed outside the framing, and the power is conveyed to the wheels by external cranks and connecting-rods. Engines in which the machinery is thus arranged may be greatly enlarged in all their parts without raising the centre of gravity, the depth required for working the cranks and eccentrics under the boiler being saved; and they have the further advantages of far greater strength in the axle, and of the whole of the machinery being easy of access for the purpose of examination and repair. The 'long-boiler' engines of the narrow gauge are very large; but those of the Great Western Company are still more so. One of the engines of this company has about 1750 square feet of heating surface in the boiler; has cylinders of 18 inches diameter and 24 inches stroke; driving-wheels of 8 feet diameter; and two pair of bearing-wheels of 4 feet 6 inches diameter. The total length is 24 feet; the distance between the supporting wheels 16 feet; the weight of the engine alone, without fuel or water, 28½ tons, and of the

tender, 10 tons; and the total weight of engine and tender, when loaded, about 56 tons. These engines, in the express train between London and Exeter, go at a speed, in some parts, of 60 miles an hour.

The stock of locomotive engines belonging to the larger companies is of great magnitude. That of the London and North Western Company exceeds 500 in number, and has cost about one million sterling.

Small and light locomotives have been recently introduced, fitted for the traffic of branch lines.

Rope Traction.—The heavy expenses attending the use of locomotive engines, their great weight, and the injury they cause to the rails, led to an opinion that stationary engine-power might be applied more advantageously. The working of stationary engines is unquestionably the most economical, but the friction of ropes to convey their power to the carriages forms a serious drawback. The inclined plane at Camden Town was at first worked by an endless rope, conducted along both tracks by grooved pulleys or sheaves, to keep it off the ground, and passing at each end round a wheel fixed below the level of the road, an upper one being turned by the engine. A contrivance was added to keep the rope always at the requisite degree of tension. It has been proposed, in hilly countries, to use natural or artificial falls of water instead of steam-engines for such an apparatus. Another mode of employing the power of stationary engines is by means of what are called *tail-ropes*, an ingenious application of which was adopted on the London and Blackwall Railway. Though a considerable degree of efficiency was attained both at Camden Town and on the Blackwall line, yet the wear of the ropes and other expenses were so great, that locomotive engines have been substituted at both places.

Atmospheric Railways.—The idea of producing motion by atmospheric pressure was conceived by Papin, the well-known French engineer, nearly two centuries since. After slumbering for more than a century, the subject was successively taken up by Lewis, Medhurst, Vallance, Pinkus, Clegg, and Samuda. The schemes of Medhurst and Vallance both proceeded on the basis of laying down a railway within a large tube or small tunnel, and propelling the carriages through it by atmospheric pressure. Mr. Pinkus changed the plan, and placed the carriages outside the tube, with certain mechanical contrivances to connect the carriages with a piston traversing the interior of the tube.

In 1840 Messrs. Clegg and Samuda devised a system of atmospheric traction, which they tried on a small portion of the West London Railway. It so far succeeded that the directors of the Dublin and Kingstown Railway determined on adopting it for an extension of their line to Dalkey; and in 1845 the Croydon Company laid down similar apparatus on the Croydon Railway by the side of the locomotive-engine line. In 1847 the same system was adopted on portions of the South Devon Railway.

The principle of the apparatus may be thus briefly described:—The tube, which is formed of cast-iron, in convenient lengths, and flanged together, is laid in the middle of the railway track, and firmly secured to sleepers imbedded in the road. Its diameter may be different on different lines; but on the Dalkey line, which rises 71 feet in a distance of a mile and three-quarters, a tube of about 15 inches is used. Along the upper side of the tube is a continuous slit or opening, and a little on either side of it are vertical ribs or cheeks, cast with the tube, the space between which forms a trough wherein the valve may lie secure from injury. The valve itself consists of a piece of strong leather, firmly inclosed between two pieces of iron, the undermost of which exactly fits the slit in the pipe. One edge of the leather forms a hinge; and the more perfectly to prevent the ingress of air, the opposite or opening edge is, when closed, hermetically sealed with a composition of wax and tallow. The interior of the tube is completely lined with a soft composition, which fills up all little irregularities, and renders the passage perfectly smooth and even; and the piston is surrounded by leather collars in such a way as to be perfectly air-tight, and yet to move with very little friction. The piston is attached to the fore end of a rod which carries rollers so fixed as to lift up and open the valve immediately after the piston has passed; it thus allows room for the passage of the connecting-bar by which the piston is united to the foremost carriage of the train. The carriage has a heated roller which presses on the valve after the passage, and seals the opening by partially melting the composition. The end of the tube behind the train is left open, to admit the air by which the piston is to be impelled; but the end in advance of the train is closed, and the air is pumped out from the tube by a branch pipe near it, leading to the air-pumps, which may be worked either by a steam-engine or by any other prime mover of sufficient power.

The Atmospheric Railway has been abandoned on the Croydon line, as well as on the South Devon line, where it was also tried, and is now retained only between Kingstown and Dalkey, near Dublin, where circumstances seem to be peculiarly favourable to the system.

Statistics of British Railways.—The railways laid down before the present century were mostly of very limited extent; and being for the use of private establishments, were usually formed without the authority of an act of parliament. The first railway established in this country as a distinct undertaking, and intended for public use, was the Surrey Iron Railway, the company for which was incorporated in 1801. In the following twenty years only twenty new railway companies were incorporated; but the Stockton and Darlington Railway, the act for which passed, after much opposition, in 1821, gave an impulse to this kind of enterprise.

Between 1801 and 1840 there were 299 acts passed relating to railways. These sanctioned the construction of about 3000 miles of railway; but many of the schemes were afterwards abandoned. Down to 1840 about 1100 miles of railway were finished and open, and about 60,000,000*l.* had been expended on them.

The following is a table of railway enactments, and lengths of line sanctioned, in the nine years 1841-9 :—

Year.	Acts.	Length.
1841	19	14 miles.
1842	22	67 „
1843	24	91 „
1844	48	797 „
1845	120	2883 „
1846	270	4790 „
1847	184	1663 „
1848	83	300 „
1849	35	50? „
	805	10,655 „

Taking the earlier acts at 299, and mileage at 3000, we have a total of 1004 acts of parliament sanctioning railways, and about 13,650 miles of railway so sanctioned. This includes the lines which have been abandoned.

On the 1st January, 1849, the number of miles of railway open for traffic in the United Kingdom was 5127, and the length in progress 2111 miles more, making 7238 miles. Down to that date there had been expended on these various works the sum of 200,173,059*l.* Of this sum about three-fourths had been provided by shareholders, and the rest by loans at specified rates of interest for specified periods. Upwards of 150,000,000*l.* remained yet to be raised by the powers of the respective acts.

The railways open for traffic on June 30, 1849, were 5448 miles in length. The passengers conveyed in twelve months, from June 30, 1848, to June 30, 1849, were 60,392,187. The gross receipts for conveying them amounted to about 7,000,000*l.*; and the goods-traffic to about 5,000,000*l.*, making an aggregate receipt of about one million sterling per month.

Statistics of Foreign Railways. — The lines of railway in France now extend from Paris through Rouen to Hâvre, with a branch to Dieppe; to Amiens, with extensions to Boulogne, Calais, Dunkerque, and the Belgian frontier; to Strasburg (in progress); to Lyon and Avignon (open to Tonnerre, and from Dijon to Châlon, with a branch from Fontainebleau to Troyes); to Orleans, Tours, Nantes, and Bordeaux (partly open); to Brest (open to Chartres); from Orleans to Bourges and Chateauroux; from Avignon to Arles, whence lines run to Marseille, Nîmes, Alais, Montpellier, and Cette; from Lyon to St. Étienne and Roanne; and a number of minor lines. A large amount of English capital is invested in these lines.

In Belgium a comprehensive system of railways has been established by the government. The scheme was sanctioned by the legislature in 1834, and the first section of railway was opened in the following year. The lines are so planned as to connect all the great towns of Belgium.

Holland has a small extent of railways, sufficient to connect the towns of Amsterdam, Rotterdam, the Hague, Utrecht, Arnhem, &c., with each other and with the general system of continental railways.

Germany has made great advances in the railway system within the last three years. From Hamburg on the north to Trieste on the south, from the Rhine on the west to Hungary on the east, most of the great towns are now placed in railway communication with each other. The total length of railways in Germany exceeds 5000 miles, of which about 2050 are in Prussia, 690 in Austria, and 2370 in the rest of the German states.

In Russia the chief line is from St. Petersburg to Moscow, 420 miles, not yet completed.

In Italy short lines extend between some of the principal towns; as from Milan to Monza, Milan to Treviglio, Venice to Milan, Naples to Castellamare, Naples to Capua, Leghorn through Pisa to Florence (open to Verona), and a few others. In Sweden and Denmark there are two short lines. In Switzerland, Turkey, and Greece, there are (so far as we are aware) none.

Two lines for India were, in 1849, sanctioned by acts of parliament. In South America there are as yet no railways. In Central America, owing to the stimulus produced by the gold mines of California, a railway has been determined on across the Isthmus of Panamà.

The successful introduction of locomotive engines on railways in England was immediately followed by the formation of numerous important lines of railroad in North America. In many cases the country over which these lines have been made is favourable in a degree unparalleled in this country; and, owing to the cheapness of land and timber, the great facilities offered by the various states, and the apparently slight construction of many lines, their average cost has been greatly below that of English railways. Many lines are laid with only one track, and the gradients and curves are often less favourable than those of the railways in this country, the thin population of the districts passed through, and the high price of labour, precluding much expense in cuttings and embankments. Timber is used extensively in the construction of the permanent way, on account of the facility of working it, and the expense of stone and iron. American locomotive engines do not usually travel so fast as those made by British manufacturers, but they are frequently adapted for ascending steeper inclined planes, and for travelling curves of small radius. The carriages used are very large and commodious, some being as much as fifty or sixty feet long, mounted on eight wheels, and so arranged that passengers may walk from one end of the train to the other. The total length of railways in the United States at the end of 1848 was 5703 miles.

The island of Cuba has several railways connecting the great sugar and coffee estates with the chief ports of the island. There is a railway also in Jamaica. In South Australia a line of railway, 7 miles in length, is in course of construction, to join the city of Adelaide with its port.

RAIMBACH, ABRAHAM, was born in London in 1776. His father was a Swiss. Raimbach was educated in Archbishop Tennison's library-school, and apprenticed in 1789 to J. Hall, the engraver. After his term of apprenticeship was over, he entered as a student

in the Royal Academy. By his general attention and assiduity, he was enabled to unite the profession of a miniature painter with that of engraver, but he soon abandoned the former.

In 1802, by the profit of some plates executed for Smirke's illustrated edition of the Arabian Nights, he was enabled to pay a visit to Paris to view the Louvre. He has given a long account of this tour in his autobiography, published by his son. In 1805 he married, and established himself in Warren Street, Fitzroy Square, London, where he lived 26 years, and executed all his great works. In 1807 he made the acquaintance of Wilkie, and in 1812 became his engraver. The first fruit of this partnership was the celebrated print of the 'Village Politicians.' The next print was 'The Rent Day,' published in 1816; after which Wilkie and Raimbach made a tour together in the Netherlands. The rest appeared in the following order: 'The Cut Finger,' 'The Errand-Boy,' 'Blindman's Buff,' 'Distraining for Rent,' 'The Parish Beadle,' and, in 1836, 'The Spanish Mother and Child.' His engravings are very masterly works. He died Jan. 17, 1843, in easy circumstances.

RAIMONDI, MARC ANTONIO, commonly called by his baptismal names Marc Antonio only, was born at Bologna about the year 1487 or 1488. He was instructed in design by Francesco Maria Raibolini, known as Francesco Francia. One of his earliest engravings on copper was a plate from a picture by Francia, representing Pyramus and Thisbe, dated 1502. At Venice, whither he removed, he re-engraved on copper, with remarkable fidelity, a set of thirty-six prints engraved on wood by Albert Dürer, representing the Life and Passion of our Saviour. At Rome he was noticed by Raphael, who employed him in engraving from his designs. Among the prints which he engraved after this master was the Murder of the Innocents. After the death of Raphael, in 1520, Giulio Romano engaged Marc Antonio to engrave from his designs. Subsequently he engraved for Bandinelli the Martyrdom of St. Lawrence from a picture by that artist, which procured him the protection and support of the pope.

On the sacking of Rome by the Spaniards, in the year 1527, he was obliged to fly, having lost all he had acquired by his art. He returned to his native place, where he continued to engrave until 1539, which is the date affixed to his last plate, representing the Battle of the Lapithæ, after Giulio Romano. He is said by Malvasia to have been assassinated by a Roman nobleman, for having, contrary to his engagement, engraved a second plate of the Murder of the Innocents, from the design of Raphael. This engraver may be considered one of the most eminent artists in that branch that has ever appeared. In the Print Room of the British Museum there is a very fine collection of his works.

RAIN. The atmosphere surrounding the earth is known to consist of air and aqueous gas or vapour, having, whether separate or in combination, equal degrees of elasticity when their temperatures are equal. It is supplied with humidity by evaporation from the waters of the earth, and its power to hold the water in solution depends on its temperature, an increase of the latter augmenting that power, and a decrease diminishing it.

Now the quantity of moisture in the atmosphere will at all times be nearly equal to the greatest quantity that can be maintained in it in a state of vapour at the existing temperature. Therefore if two volumes of air thus saturated with moisture, but of different temperatures, become by any means mixed together, a mean degree of heat results from the union; but the whole quantity of moisture in the sum of the volumes of air will be greater than that which the mean temperature can support, and the excess will of course be condensed or precipitated in the form of rain, snow, or hail, according to the temperature of the region through which the aqueous particles pass.

In order to illustrate the general subject of clouds and rain, the late Professor Daniell, in his 'Essays on the Constitution of the Atmosphere,' imagined an atmosphere consisting of a permanently elastic fluid mixed with aqueous vapour, and surrounding a sphere of water of uniform temperature; and he observed that, since the evaporation would be slow, the small quantity of water precipitated would be almost immediately dissolved by the superior temperature of the stratum below, into which it would tend to fall; therefore this atmosphere would be free from clouds. But in the event of the temperature of the sphere increasing from the poles to the equator, the evaporation in the latter region would destroy the regular gradation of temperature in the atmosphere from the surface of the sphere upwards. The evaporated water rising to the middle regions would there, in consequence of the diminished temperature, give out its latent heat and become condensed; then descending, it would acquire from below a new portion of heat, with which it would rise till it was again forced to part with its caloric. This process may be supposed to continue till those regions of the atmosphere become saturated with vapour, and at the same time rarefied by the heat. The rarefaction of the air would diminish its resistance to the general movement of the vapour towards the poles, and thus the vapour would rush with force in those directions; but on arriving in latitudes at which the temperature is too low to allow the air to hold it in solution, condensation would take place, and clouds would be formed.

The circumstances just mentioned correspond nearly to those which would take place about the earth, if local and other accidental circumstances did not interfere with the general process. After their formation the clouds are driven about by the winds, receiving new accessions of precipitated vapour till the air is no longer capable of supporting them, and then their substance descends in rain, snow, or hail.

The mean temperature in any latitude being known, the quantity of moisture in the atmospherical column at that latitude can be found, since it depends on the temperature; hence, knowing also the variations to which the temperature of the atmosphere at the place is subject in the course of the year, the mean annual depth of rain in that

latitude may be computed. On such principles, Humboldt has determined that the mean annual depth of rain should be, at the equator, 96 inches; in lat. 45°, 29 inches; and in lat. 60°, 17 inches. The results of observation show that, in proceeding from the equator towards the north pole, there is in reality a diminution in the mean annual quantities of rain.

From an average of the observations made during fourteen years (1810 to 1823 inclusive), the mean annual depth of rain on the Malabar coast is 123.5 inches, and the mean annual temperature is 80.4° (Fahr.), but the annual depths of rain are very irregular and differ considerably. From a mean of observations for seven years (1817 to 1823 inclusive), the mean annual depth of rain at Bombay was only 85.24 inches. From a mean of observations during seventeen years (1802 to 1818 inclusive), Dr. Dalton makes the mean annual depth of rain at Manchester equal to 33.596 inches, the mean annual temperature being 47.6°. In regions where the trade-winds blow constantly, rain seldom falls; and the reason may be, that both the temperature and the currents of air being there nearly uniform, the vapours raised from the ocean are carried about the earth without suffering those partial accumulations by which condensation and precipitation might be produced. But elsewhere the irregular distribution of land and water, the existence of mountain-chains, and even the various capacities of different parts of the earth's surface for absorbing or communicating heat, independently of variations in the electricity of the air, are to be considered as the most frequent causes of perturbation in the general currents of the atmosphere, and consequently of the fall of rain.

The dense mists which rest on the ocean near Newfoundland are precipitations, caused by inequalities in the temperature of the ocean in the line of the Gulf-Stream. The rains which frequently deluge the tropical islands are in part produced by the volumes of air which are intermingled by the sea and land breezes; and those which fall at the time of the summer solstice in Africa may be ascribed to the immediate precipitation of the vapours which flow from the seas to supply the place of the rarefied air above the heated lands, while the drought which prevails in the sandy deserts of that quarter of the earth is explained by the level character of those deserts, over which the currents of air may be supposed to flow nearly without interruption.

In tropical regions the quantities of rain which fall in different months of the same year are very unequal: at Bombay the mean monthly depth in June was found to be 24 inches, and in October, 1.26 inches. In temperate climates the quantities differ much less, but more rain falls during the second half year than during the first. The means of observations continued during 40 years at London give, for the depth of rain from January to July inclusive, 8.539 inches, and from July to December inclusive, 12.147 inches.

In general the lowest stratum of air about the earth contains the greatest quantity of water in solution; and hence it might be expected that more rain should fall on low level plains than in elevated countries. The contrary however is the fact: and this may be accounted for by the variety of currents among mountains, and by clouds resting frequently on the summits of hills without descending to the plains. Yet it appears that the depth of rain on the level of the ground is greater than at the top of a building. Dr. Heberden found that the annual depth at the top of Westminster Abbey was 12.099 inches, while at a lower level, on the top of a house in the neighbourhood, it was 18.139 inches; and on the ground, in the garden of the house, it was 22.608 inches.

RAIN-GAUGE, a vessel for measuring the quantity of rain which falls on any particular part of the earth's surface, the quantity being indicated by the depth of the precipitated water which would cover the ground about the spot, supposing the ground to be horizontal, and that the water could neither flow off nor penetrate into the soil.

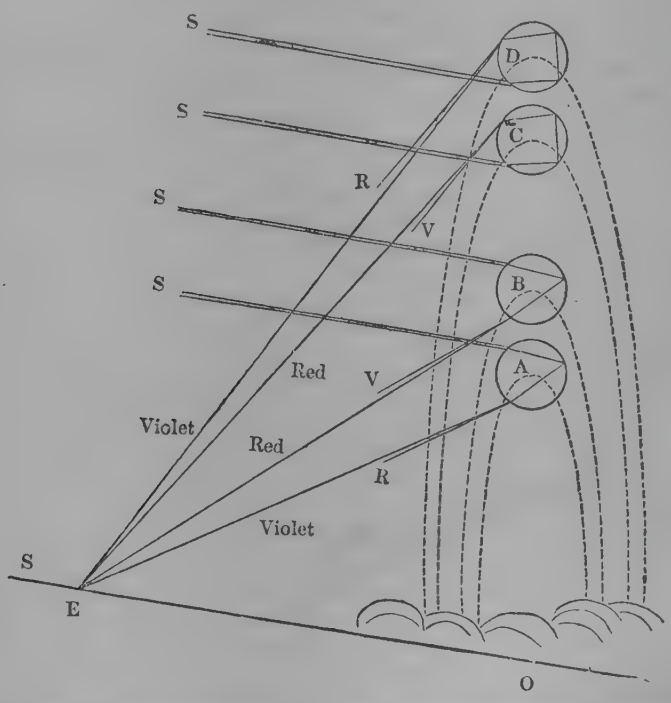
This instrument, which has been called indifferently udometer (ὕδωρ and μέτρον), pluviometer (pluvia), and ombrometer (ὄμβρος, rain), now generally consists of a conical funnel, open both at top and bottom, the lower extremity entering into a cylinder below, which thus receives the rain from the funnel. A graduated rod passes through a perforation in a bar fixed in the direction of a diameter of the cone at its upper surface, and is attached, at the lower extremity, to a circular piston, which has nearly the same diameter as the interior of the cylinder: the weight of the piston and rod is such as to allow the former to float with its upper surface on a level with the surface of the water. A rim, of a cylindrical form, rises a little way above the upper extremity of the conical part of the funnel, in order to prevent the rain-water, which would strike the interior of the latter near that extremity, from being thrown out in consequence of the shock.

The diameter of the funnel at the top may be 12 inches, and that of the cylinder 6 inches; in which case the area of the horizontal section on which the rain falls will be to that of the cylinder in the ratio of four to one. Hence a depth of water equal to 1 inch at the horizontal section will be expressed by a space equal to 4 inches on the length of the rod; and, each of such spaces being divided into 100 parts, the depth of water at the said section will be indicated in hundredths of an inch. The height of the cylindrical vessel below the funnel may be from 25 to 30 inches.

For the sake of diminishing the evaporation and of measuring small quantities of rain with greater precision, the diameter of the cylinder is sometimes reduced to 2 inches, and the collected water is, by means of a small pipe, inserted in the bottom of the cylinder, and furnished with a cock made to pass into a glass tube whose interior diameter is half an inch. In this case, the diameter of the upper extremity of the funnel being the same, a shower of rain whose depth on the ground might be one-hundredth part of an inch, would be indicated by 5.76 inches in the tube.

RAINBOW, a circular arch of variously-coloured light which is visible in the heavens when the sun or moon is shining, and when, at the same time, a shower of rain is falling on the opposite side of the spectator. When the rain is abundant, a second bow is commonly seen on the exterior, and concentric with the first; their common centre being a line drawn from the luminary through the eye of the spectator and produced towards the opposite part of the heavens. Both bows consist of concentric bands of the different prismatic colours arranged as they appear in the solar spectrum, but the order in which they are disposed in the first bow is inverted in the second. The lower edge of the interior bow is violet and the upper edge is red; on the contrary, the lower of the exterior bow is red and the upper edge is violet.

Newton ascribes the earliest explanation of the bow to Antonio de Dominis, bishop of Spalatro; but Descartes is certainly the first who has distinctly explained the causes by which two bows of bright light may be produced. He gives however no indication of the bands of colours of which they consist; and it was only when Newton had discovered the different degrees of refrangibility in the different coloured rays which compose a pencil of common light that there could be assigned the cause of those coloured bands, their position, and the breadth which they occupy.



Let A, B, C, D, be four globules of rain in a cloud covering a considerable part of the heavens on one side of the horizon. Let E be the eye of the spectator, and, on account of the remoteness of the sun, let the rays of light which proceed from his disk be considered as parallel to one another. Let SE be a line drawn from the sun through the eye of the spectator, and let it be produced towards O; also let SA, SB, &c., be very slender pencils of parallel rays proceeding from the sun, and falling upon the globules of water.

Now it is shown by Newton that, when the angle $AEO = 40^\circ\ 17'$, the dispersion of the coloured rays, on emerging from the lower part of the drop A, after reflexion at its posterior surface, will be such that the violet rays alone will enter the eye of the spectator at E, the other rays falling below: and when the angle $BEO = 42^\circ\ 2'$, the red rays alone will enter the eye, the other rays passing above. If the interval between the drops A and B were occupied by other drops, it may easily be imagined that the pencil of rays which go from them to the eye would be of all the prismatic colours between the red and the violet; and that thus there would appear in the heavens a spectrum whose length should subtend at the eye an angle equal to $2^\circ\ 15'$ (the sun's diameter together with the difference between the angles above mentioned). Therefore if all the lines drawn to E from the drops in the spectrum were to revolve conically about EO as an axis, the drops of these lines would be in situations to send to the eye rays of the particular colours; and thus there would exist, in the heavens, the appearance of a circular band of variously-coloured light.

Again, if the angle $CEO = 50^\circ\ 59'$ the emergent pencil, after two reflexions at the posterior surface of the drop C, will suffer such dispersion that the red rays only will enter the eye at E; while if the angle DEO be $54^\circ\ 9'$, the violet rays only will enter the eye. Thus, with the intermediate drops, there will be formed a second spectrum whose length is $3^\circ\ 40'$; and, by drops in the circumferences of circles passing through these, a bow concentric with the former.

A rainbow can never be greater than a semicircle, unless the spectator be on elevated ground; but a portion of a bow has occasionally been seen

in an inverted position on the ground by the refraction of the light in drops of rain adhering to the grass or the leaves of trees. It may be added that a coloured bow similar to that which is produced by rain may be observed in the spray from a fountain when the jet of water is agitated by the wind, and also in the mists which at times lie upon low grounds.

The lunar rainbows appear in general white; and when they are coloured, they differ from those produced by the sun only in the colours being much more faint.

The circle of light which is occasionally seen surrounding the sun or moon at some distance from the disk of the luminary, is called a *halo* or a *corona*, and is caused by the refractions of light in particles of ice which float in the air. [HALO.]

RAISINS. The dried fruits of several varieties of the vine are called raisins, a term derived from the French, *Raisin* in that language being a general name for grapes, the dried fruit being distinguished as *Raisins Secs ou Passés*.

Raisins are named after the countries where they are produced, or the places whence they are imported; as Malaga, Valencia, and Smyrna. The peculiar small and generally seedless grapes, formerly called *Corinths*, are now better known as the dried or Zante *Currants* of the shops.

The most simple, and, when circumstances are favourable, the best mode of preparation is to dry the grapes, after being cut when fully ripe, by exposure to the heat of the sun on a floor of hard earth or of stone. Another method is to cut the stalk half-way through when the grapes are nearly ripe, and leave them suspended till the watery part is evaporated; the flow of sap is in a great measure prevented from entering the fruit, in consequence of the incision, and whilst evaporation continues to go on undiminished, desiccation must take place.

The currant-grapes are gathered in the end of August and beginning of September. Rains often spoil the crop when they occur at the time of gathering or drying. The fruit, when sufficiently dry, is separated from the stalks by small rakes, and afterwards stored in magazines, 'seraglie,' constructed somewhat like a lime-kiln, having an opening at top, where the fruit is put in, and a door at bottom, opened only at the time of sale. The fruit is rendered so compact by its own weight, that considerable force is requisite to break it up for the purpose of being packed in the large casks in which it is exported.

The Malaga raisins are esteemed the finest; and the muscatels from thence exceed all others in price. The black Smyrna raisins are those of least value. The white grape of Alexandria furnishes very fine raisins.

An oil exists in the seeds of the grape, in the proportion of 12 pounds of oil to 100 pounds of seeds. Though it is not obtained without difficulty, it is extracted in Italy in large quantity. When heat is used, it has a harsh taste, and is mostly used for burning; but when cold-drawn, it may be used for food.

Tannin of the purest kind may be obtained from the seeds of the grape.

Nearly all the raisins imported into this country are from Spain and Turkey. Of the total quantity imported, 99 per cent. is from these countries, namely, 64 per cent. from Spain, and 35 per cent. from Turkey. A small supply is received from Portugal, Italy, and the Cape of Good Hope.

RAJA is a Sanscrit word, signifying king or ruler, and is probably the same word as the Latin *rex, reg-is*. In the ancient writings of the Hindoos the word is applied to all the different kings or princes of Hindustan, and the title is still given to native princes.

RAJAHMUNDRY. [CIRCARS.]

RAJMAHAL, a town of Hindustan, in the presidency and province of Bengal, on the west bank of the Ganges, in 25° 2′ N. lat. and 87° 53′ E. long. Though formerly a large city, and at one time the capital of the province of Bengal, it now consists of little more than a long street of mud huts, some tombs and dilapidated mosques, and the ruins of a vast palace, which was built by the Sultan Sujah, brother of the emperor Aurungzebe, and completed in 1630. In the following year however a fire destroyed the greater part of the town and a considerable part of the palace; and not long afterwards a branch of the Ganges changed its course, and carried away nearly all the houses which remained. The Mogul governor of Bengal then transferred his residence to Dacca, and Rajmahal has since been comparatively in a state of decay. Its population however is said to exceed 20,000.

RAJMAHAL HILLS, a group of mountains which derive their name from the town of Rajmahal, near which the southern part of them commences: they extend about 60 miles northward along the west bank of the Ganges. They form a detached mass, resemble the greater part of the Welsh mountains both in height and general appearance, and occupy an area perhaps equal to Merionethshire and Caernarvonshire. They are bounded on all sides by a level country, and rise from the flat surface of Bengal as if out of the sea. They are well wooded, and there is much thick jungle, so that they abound in wild animals of all kinds, from the jackal to the tiger, and from the deer to the elephant and the rhinoceros.

The Rajmahal Hills, and indeed all the hilly country between Rajmahal and Burdwan, are inhabited by the *Puharrees* (or mountaineers), who appear to be an aboriginal race, differing from the inhabitants of the plain in features, language, manners, and religion. In stature they are rather short, but strong and active. They live chiefly by the chase, in which they use bows and arrows, few of them having fire-arms. In addition to hides and game, they dispose of wax and honey, in which their hills abound, and they cultivate millet in considerable quantity.

Their language differs very remarkably both from the Hindustanee and the Bengalee, but is said to bear a striking resemblance to that of the Bheels and the Gonds, so that these tribes are apparently different branches of the same great family, which extends over all the mountainous centre of Hindustan.

The Puharrees have no castes; they care nothing for the Hindoo deities; and they have no idols or images of any kind. A black stone found in the hills is consecrated by some ceremonies, and used as an altar. Buffaloes, hogs, fruits, fowls, grain, and spirits, are on certain occasions offered up to the gods, and afterwards feasted on. A school for the education of the Puharrees has been established at Boglipoor.

RAJPOOTA'NA, an extensive territory of Hindustan, so called because the greater part of it belongs to the Rajpoot princes. It is, to a considerable extent, coincident with the ancient province of *Ajmeer*. *Rajast'han*, or 'the abode or country of princes,' is another name for the same territory. Rajpootana is situated between 22° 45′ and 31° N. lat., and 68° 25′ and 77° 45′ E. long. It is bounded N. and N.W. by Lahore and Mooltan, W. by Sinde, S. by Gujerat and Malwa, and E. by Agra and Delhi; but the boundaries are very irregular, and not distinctly defined. Its greatest length S. to N. is about 480 miles, and its greatest breadth E. to W. about 400 miles. If estimated as a square, each side would probably be about 300 miles; so that its territory may be reckoned at 90,000 square miles.

Rajpootana consists of 10 principalities, besides the Batti country, or Hill States. The principalities are—Bikaneer, Jessulmeer, Marwar (or Joudpoor), Jypoor (or Jynagur), Mewar (or Oodipoor), Cutch, Sirohi, Kotah, Boondee, and Dholpoor, of which the respective areas are stated under HINDUSTAN, vii. 217. The total population is estimated at about 12,000,000. The city of Ajmeer, with a small territory surrounding it, belongs to the British.

The great chain of the Aravulli Mountains stretches, in a north-eastern direction, through the greater part of Rajpootana, from the hilly country which connects it with the Vindhya Mountains almost to the confines of Delhi. [ARAVULLI.] Nearly the whole of the country west of the Aravulli is a sandy waste, extending northward to the Ghurra branch of the Indus, and rising towards the south in a succession of steppes. In this barren territory are comprised the principalities of Marwar, Jessulmeer, Bikaneer, Sirohi, and Cutch. A few oases occur, the largest of which are those in which the towns of Joudpoor, Jessulmeer, and Bikaneer are situated. To the north-east is the country of the Batti, the Hill States, which is separated from Lahore by the river Sutlege. To the east of the Aravulli Mountains, and running nearly parallel with them, are the Chitore Mountains. [HINDUSTAN, vii. 206.] The country between the two ranges, which is from 60 to 100 miles broad, comprises the principalities of Mewar, Boondee, and Jypoor. Dholpoor lies S. of Agra, and Kotah is on the east side of the Chitore Mountains, in a rocky district.

Rajpootana, west of the Aravulli Mountains, is for the most part little better than a desert; vast tracts of it consist of nothing but fine sand, on which not a blade of grass grows, and which the winds form into hills, sometimes 80 or 90 feet high, which continually change their form and position. In some places the sand is more consolidated, and mixed with stones, and produces stunted bushes and coarse grass, which afford a scanty supply of pasturage to a few herds of camels and flocks of sheep in the season when the periodical rains occur, which however are of short duration and not abundant. A village is found here and there, consisting of huts made of straw, and surmounted by a conical roof. A few fields surround the huts, and these are inclosed by a hedge of stunted thorns. The aspect of the country somewhat improves as it rises towards the Aravulli Mountains on the south-east, the oases become more frequent, and those large ones in which the great towns of Jessulmeer, Bikaneer, and Joudpoor are situated, are tolerably fertile. The whole of Marwar indeed has a better soil, and is in a better state of cultivation, than the other principalities on the west of the Aravulli Mountains, and as good as most parts of those on the east. There are numerous wells for irrigating the land, but, as they are very deep, agriculture is expensive. The capital of Marwar is *Joudpoor*, a large city, situated in 26° 18′ N. lat., 73° 5′ E. long. The castle, in which the raja resides, is a large and magnificent building. *Nagore*, in 27° 8′ N. lat., 73° 33′ E. long., is surrounded by barren sand-hills, and is badly supplied with water.

Rajpootana, east of the Aravulli range, though its soil is of a similar sandy character to that on the west, is much more fertile, and generally better cultivated. The periodical rains are more abundant and continue longer. Wells for the purpose of irrigating the land in the dry season are very numerous, and many of them are 200 feet deep.

The principal rivers of Rajpootana are—the Chumbul [HINDUSTAN, vii. 206]; the Bunnass, an affluent of the Chumbul; and the Loony, or Salt River, which flows through Marwar, and disappears in the great salt marsh of the Runn.

The climate of Rajpootana is oppressively hot in summer (from February to July), with parching winds. In winter it is colder than is pleasant in a country where fuel is everywhere scarce and extremely dear. The dried dung of camels or cows is almost universally used for fuel.

The surface of Jypoor is in general level. The soil is for the most part sandy and arid, and in many places is strongly impregnated with salt, a considerable quantity of which is manufactured both for home use and for exportation. The cultivated fields are watered by means of wells, there being no permanent streams. The principal articles of produce are cotton, tobacco, and wheat, with some smaller grains. Cattle are reared for draught, and sheep for their wool. Jypoor is more populous than most of the other Rajpoot states. *Jypoor*, the capital, is situated in 26° 54′ N. lat., and 75° 38′ E. long. The town stands in a valley open to the south, and is surrounded by a stone wall. It is well and regularly built, with four principal streets, which meet in a large square.

The small territory of Boondee may be considered as included under the same head as Jypoor. The principality of Kotah, though small,

is somewhat larger than Boondee. The town of Kotah is seated on the Chumbul, a branch of the Jumna, in 25° 12′ N. lat., and 75° 47′ E. long.

Mewar, though mountainous, is tolerably fertile, and produces all kinds of grain, sugar, indigo, and cotton. Good pastures are rare, and the cattle are smaller than in the neighbouring districts. *Oodipoor*, the capital of Mewar, is in 24° 34′ N. lat., and 73° 45′ E. long. It is seated in a mountainous district, and is a place of great strength, which can only be approached by three narrow defiles. *Chitore*, the former capital, having been taken by the Mohammedans, Oodipoor became the residence of the raja or ranah, as he is called. The town of Chitore is situated in a rocky plain, in 24° 53′ N. lat., and 74° 45′ E. long., on the banks of the Bunnass. It is a tolerably large town, with many pagodas.

Ajmeer, in 26° 28′ N. lat., and 74° 42′ E. long., is a moderate-sized town on the slope of a high hill. The houses are well built. On the top of the hill is a remarkable fortress called Taraghur, which is a place of great strength, and is in most parts inaccessible. Just above the town of Ajmeer is a large lake, which was formed by the emperors of Delhi by damming up the outlet of an extensive valley, into which a number of rills were conducted. The lake is four miles in circumference in dry weather, and six during the rains. It affords the means of irrigation to a large district on its banks, supplies abundance of excellent water to the inhabitants of Ajmeer, and is full of fish. In 1818 the city of Ajmeer, with the surrounding district, was ceded to the British by Dowlet Rao Sindia, in exchange for a part of the territory of Malwa.

Cutch, with its towns, is described under HINDUSTAN, vii. 205.

The other principal towns of Rajpootana which have not been noticed, are the following:—*Bikaneer*, in 27° 58′ N. lat., and 73° 20′ E. long., a large town surrounded by a wall and ditch. The raja resides in a fort not far from the town, where there is an excellent spring of fresh water. *Boondee*, the capital of the principality of Boondee, is a small town on the side of a range of hills, on the summit of which is the raja's palace, a large stone edifice strongly fortified. *Jessulmeer*, in 26° 48′ N. lat., 71° 6′ E. long., situated in an oasis of the great sandy desert, contains a population estimated at 20,000. *Tonk*, on the Bunnass, is in 26° 12′ N. lat., and 75° 47′ E. long. *Kishengurh*, in 74° 57′ N. lat., and 26° 38′ E. long., is situated on a chain of granite hills, surrounded by walls of solid masonry, and with its castle on the mountain top.

The inhabitants of Rajpootana consist principally of Rajpoots, who are Hindoos, and Mohammedans, of whom there is a considerable number. The remainder of the inhabitants consist of Bheels, Jains, Jauts, and Mairs. Till they came under the protection of the British they were little better than robbers, and were engaged in incessant warfare with each other: consequently the towns and many of the larger villages of Rajpootana are fortified, and generally placed in situations where they might be protected by a fortress on a rocky height. The Bheels are a wild race, who dwell generally in the mountain-fastnesses, whither they appear to have been driven by the Rajpoots. They bear a strong resemblance to the Puharrees of Rajmahal. [RAJMAHAL HILLS.] The Jauts are in considerable numbers in all parts of Rajpootana, and the whole of the Batti race may be considered as belonging to them. The Mairs inhabit the Aravulli Mountains.

The Rajpoot states were never properly subjected by the Mohammedan emperors; for though they were compelled to pay a tribute and furnish a certain number of mercenary soldiers, they continued in a state of half independence. After the death of Aurungzebe, in 1707, Rajpootana continued nominally subject to the Emperor of Delhi till 1748, when its chiefs became independent. Since then they have placed themselves under the protection of Great Britain. The rajas of Rajpootana are independent sovereigns, but an English officer commands the forces, and a garrison has been established at Ajmeer sufficient for its protection against enemies, and also to keep the Rajpoot chiefs themselves in subjection.

(Tod's *Annals of Rajast'han;* Heber's *Narrative;* Mill's *History of British India.*)

RALEIGH, SIR WALTER, born in 1552, in the parish of Budley, Devonshire, was the second son of Walter Raleigh. He was entered a commoner of Oriel College, Oxford, in or about 1568. In 1569 Raleigh accompanied a volunteer corps to France in aid of the Huguenots. He served in France five years, and subsequently in the Netherlands, as a volunteer under the Prince of Orange. In 1576 Sir Humphry Gilbert, Raleigh's half-brother, obtained a patent to colonise any parts of North America not settled by the allies of England. Raleigh and Gilbert attempted a joint expedition, from which Raleigh returned unsuccessful in 1579. In the next year we find him commanding a company of the royal troops in Ireland during the rebellion raised by the Earl of Desmond. Soon after his appearance at court, his handsome person and attractive manners so far gained him the favour of the queen, that he was knighted, made captain of the guard, seneschal of the county of Cornwall, and lord warden of the stannaries, and had, with a grant of 12,000 acres of the forfeited estates of the Earl of Desmond, a lucrative patent for licensing the vendors of wine in England. In 1584, after the death of Sir Humphry Gilbert, Raleigh obtained a patent investing him with power to appropriate, plant, and govern any territories that he might acquire in North America. In 1585 the first body of colonists landed in Virginia, so called in honour of the virgin queen. After various disasters, Raleigh in 1589, finding that his resources were unequal to the forming of a colony, made over his patent to a company of merchants.

In 1587 Raleigh had been appointed one of a council of war to put the forces of the realm in the best order to withstand any invasion, and had command of the forces in Cornwall. In July, 1588, after the Armada had passed up the Channel, he joined the British fleet with a small

squadron, and greatly distinguished himself in the several engagements which ended in the discomfiture of the Spaniards. In 1589 he accompanied the Lisbon expedition, the object of which was to place Don Antonio on the throne of Portugal. In 1591 he sailed on an expedition to intercept the Plate fleet, which was unsuccessful. On his return he fell into some discredit with Elizabeth, on account of his marriage with Elizabeth, daughter of Sir Nicholas Throckmorton, and was for a short time a prisoner in the Tower. After a short confinement he retired to his estate of Sherborne in Dorsetshire. It was during this retirement that he formed his scheme for the discovery and conquest of El Dorado, an imaginary land of gold and silver in South America. He sailed from Plymouth, Feb. 5, 1595, with five vessels, and arrived at Trinidad about the end of March. He surprised the newly-founded town of San Josef, and took prisoner the governor, Don Antonio Berrio, from whom he extracted information which enabled him to ascend the Orinoco about 60 leagues, when he was forced to return. He arrived in England towards the end of the summer, 1595. Raleigh published an account of this voyage, under the sounding title of 'The Discovery of the large, rich, and beautiful Empire of Guiana.' In 1596 he was employed, with the rank of rear-admiral, at the taking of Cadiz, where he greatly distinguished himself, and was severely wounded in the leg. In 1597 he took Fayal. About this time he was restored to his post of captain of the guard, and appointed governor of Jersey.

After the death of Elizabeth, Raleigh's fortunes fell. Cecil, his former friend and associate, had completely poisoned James's mind against him. The post of captain of the guard was speedily given to another, and his wine-patent was withdrawn. An opening soon offered for a more serious attack. Lord Cobham's plot in favour of the Lady Arabella Stuart was discovered; and Raleigh was arrested as a conspirator. In Sept. 1603 he was tried at Winchester, and found guilty of high treason. Whether or not he was morally guilty may be questioned; but that his condemnation was procured by the power of his enemies, and that the verdict of the jury was not justified by the evidence, there can be no doubt. He was reprieved, and sent to the Tower, where he was confined for thirteen years. His family suffered severely by his attainder. During his long imprisonment he turned to intellectual pursuits, and, with many minor pieces, executed his great work, 'The History of the World.'

In 1615, Cecil being dead, and Somerset disgraced, Raleigh induced Sir Ralph Winwood to recommend his project of opening a mine in Guiana. Upon this he was released conditionally. He equipped thirteen vessels for this expedition. The fleet reached the coast of Guiana Nov. 1617. Raleigh was so unwell that he could not ascend the Orinoco in person. Captain Keymis, his steady follower, led the exploring party. A conflict took place with the Spaniards near St. Thomas, a small town recently built, in which the Spanish governor and Raleigh's eldest son Walter were slain; after which Keymis, having spent about twenty days in a fruitless search for the asserted gold mine returned to the fleet, and meeting with nothing but reproaches for his ill success, committed suicide. Raleigh sailed for Newfoundland to victual and refit, but on arriving there, his own crew mutinied, and the majority declaring for a return to England, he was forced to accompany them. He arrived at Plymouth, July, 1618, and was shortly afterwards arrested. James, strongly urged by the king of Spain to punish Raleigh for his attack on St. Thomas, laid the case before his council, when it was argued that Raleigh, being under an unpardoned sentence for treason, could not be tried again. James therefore resolved to carry into execution a sentence sixteen years old, which had been followed by an imprisonment of thirteen years. He was brought up before the Court of King's Bench to receive sentence, and was beheaded the next morning, Oct. 29, 1618.

RALEIGH. [Carolina, North.]

RA'LLIDÆ, a family of Birds regarded by zoologists as coming within the pale of the grallatorial order, though as to its natural position and the genera which ought in strictness to be comprehended in it, there is some little diversity of opinion.

Mr. Swainson observes, that the *Rallidæ* comprise the Rails and Water-Hens, and constitute a very natural and well-marked family in the order of Waders. They have been designated, he remarks, by these familiar names, from their peculiarly harsh notes, and from assuming much of the appearance of the gallinaceous or rasorial birds; another proof, he adds, that the true analogies of nature are often perceived by the vulgar, although passed over by the scientific. 'The most permanent differences,' says M. Swainson in continuation, 'in their structure, when compared with the foregoing families (*Tringidæ* and *Charadriadæ*), is the great size of the leg and the toes, particularly the hinder one. The body is very thin, and unusually flattened, a structure particularly adapted to the habits of Rails, since they live for the most part in the tangled recesses of those reeds and aquatic vegetables which clothe the sides of rivers and morasses. They are for the most part solitary and timid birds, hiding themselves at the least approach of danger, but quitting their semiaquatic retreats in the morning and evening, to feed in more open spots. Their flight, from the shortness of their wings, is very feeble, but they run with swiftness; and by the peculiarly compressed form of their body are able to make their way through dense masses of reeds and high grass with so much facility as to escape even after being desperately wounded. The flesh of all these birds is delicate; and from living chiefly upon aquatic seeds and vegetable aliment, they may be considered as aquatic *Gallinacea*.

The characters of the Rallidæ in general are as follows:—Feet very large; bill, in general, short and greatly compressed; tail excessively short, nearly hidden by the covers.

The following are some of the leading forms of this family:—

Genus 1, *Parra*.—The *Parræ*, or Jacanas, are remarkable for the enormous length of the legs,

toes, and claws, and especially of the hinder claw, which is sharp and straight; the wings are armed with a recurved spur. This genus is spread over South America, India and its islands, China, Australia, Africa, &c.

Mr. Swainson remarks, that the Jacanas, or *Parræ*, are wading birds, somewhat analogous, both in structure and habits, to the European Water-Hen; but in their native haunts, from not being disturbed, they are less shy. 'The number of these birds,' says Mr. Swainson, 'on the lakes of Brazil, the elegance of their movements, and their fearlessness of man, excite an interest in the traveller who journeys through regions ornamented alone by nature. They are very light birds, and their long toes spreading over a wide surface enable them to walk on the floating leaves of aquatic plants with as much facility as if they were on land. In such situations their appearance is really delusive; for their pressure being sufficient to sink the surrounding leaf just below the surface, the birds actually appear to walk upon the water.' ('Zool. Ill.,' 2nd Series.)

Example, *Parra Africana*.

Jacana (*Parra Africana*).

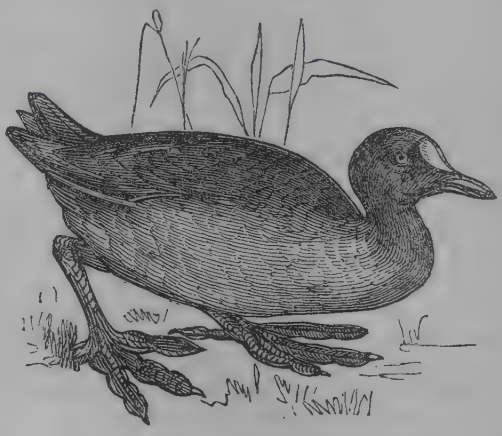
We may here observe, that a family, *Palamedeidæ*, has been proposed by the Prince of Canino, including the *Paîrræ*, the Horned Screamer, and the Crested Screamer (*Palamedea*), the Çariama (*Dicholophus*, &c.).

Genus 2, *Porphyrio*, Hyacinthine Gallinules.—M. Temminck states that the *Porphyriones* live nearly like the Water-Hens, to which they are the most closely approximated: like them, their habitual haunts are the fresh waters; but the inundated rice-fields and marshes of the south of Europe equally serve them for an asylum and retreat. More inclined by their appetite to cereal grains and plants, than aquatic herbs, the Porphyrios frequent the land more than the Water-Hens: they move with grace on the water, and run with elegance and swiftness on the land or over the plants which grow in the water. Their body is not so compressed nor so slender as that of the Water-Hens; their formidable bill, composed of a very hard substance, and nearly without a nasal fossa, which is covered by a membrane, serves them as an instrument for cracking the husks of grains and breaking the hardest stems; their feet, which they use to seize their food and convey it to their bill, are provided with very long toes, easily retractile, and with nails which bend also with some facility, which gives them a power of prehension. A brilliant plumage, where blue or a turquoise hue predominates, clothes the greatest number of the known species.

It is not clear what species of this genus was known to the ancients, who held it in high estimation. The *Porphyrio* does not appear to have been sought after for any other purpose than that of keeping it alive; indeed Ælian states that he never heard of one being served at any banquet.

Example, *Porphyrio hyacinthinus* (*Pollo Sultano*, Savi). Locality, the southern and eastern parts of Europe, as the Grecian Archipelago, the Ionian islands, the southern provinces of Hungary, Russia, &c. It is found over a great portion of northern Africa, and throughout a vast extent of Asia. This species breeds in sedgy marshes, morasses, or rice-fields. It constructs a nest of aquatic herbs, and lays three or four white eggs.

Genus 3, *Fulica*.—Of this genus the well known Coot is an example. *Fulica atra* is the *Foulque*, *Macroule*, or *Morrelle* of the French; *Schwarzes Wasserhuhn* of the Germans; *Folaga* and *Folaca* of the Italians.



Coot (*Fulica atra*).

The Coot inhabits Europe in marshes, lakes, and gulfs; very abundant in Holland and in the lakes of the interior of France; less numerous in Germany and Switzerland. Dr. Von Siebold and M. Bürger saw it in Japan.

The Coot is indigenous in our island, residing on all large sheets of water, and more especially such as are margined with a belt of dense aquatic herbage. This bird swims and dives admirably, but flies heavily. As winter sets in it seeks the open waters and æstuaries near the sea. Its food consists of worms, snails, aquatic insects, herbage, &c. The nest is a large mass of vegetable matter, concealed amidst reeds and rushy tufts, its base being sometimes below the surface of the shallow water. Eggs 7 to 10 in number, brownish white, spotted with dark brown.

Genus 4, *Gallinula*, the Water-Hens, or Moor-Hens. The species are numerous and extended over the world. The common Moor-Hen of our islands (*Gallinula Chloropus*) is dispersed over Europe, Asia, and a great part of Africa.

This bird in its different states of plumage is the *Poule d'Eau* of the French; *Gallinella* of the Italians; *Wasserhuhn* and *Braunes Meerhuhn* of the Germans; *Common Gallinule, Water-Hen,* or *Moor-Hen,* of the British.

'One circumstance,' says Mr. Gould, 'respecting this familiar bird appears to have escaped the notice of most ornithologists. We allude to the fact of the female being clothed in a dark and rich plumage, and having the base of the bill and the frontal shield of a bright crimson-red tipped with fine yellow. Her superiority in these respects has caused her to be mistaken for the male, which, contrary to the general rule, is at all times clothed in a duller plumage, and has the upper surface more olive than in the female; the bill is also less richly tinted. We were first led to notice this fact in consequence of observing the birds sitting or rising from the nest to be those whose richly-coloured bills had induced us to believe them to be males, and which the dissection of a great number of individuals has now fully proved to us to be the females. Besides this difference, the sexes vary in size, the female being about one-fifth less than her mate.' The same author states, that the young are clothed with a black down, and during the first autumn, although equal to the adults in size, have a much lighter plumage, the whole of the throat and under surface being then grayish white, and the bill and legs olive. The male has the bill red at the base, strongly tinged with olive; the centre of each feather on the flanks is blotched with a large oblong patch of white, which is the colour of the under tail-coverts; irides red: tarsi and toes greenish olive: the former being encircled with a red mark immediately above the tarsal joint, called the *garter.*

The habits and haunts of the Moor-Hen are so generally known that we need not here enlarge upon them. Ample details are given by Selby, Gould, Yarrell, and other ornithologists.

Genus 5. *Rallus*, the Rails. Example, the Water Rail (*Rallus aquaticus*).

This species is the *Rale d'Eau* of the French; *Porciglione, Merla acquarola,* and *Merla d'Acqua* of the Italians; *Wasser-Ralle* of the Germans; *Water-Rail, Bidcock, Bilcock, Velvet-Runner, Brook-Runner,* and *Brook-Ousel* of the British.

The Rails inhabit Europe generally. Habits, aquatic, shy, and retiring. 'Except when closely pressed,' says Mr. Gould, 'the Water-Rail seldoms takes to flight, but evades pursuit by quietly yet quickly traversing the bottoms of thick reed-beds and banks overgrown with luxuriant vegetation bordering the sides of pools and ditches, where it finds a covert through which its slender and compressed form enables it to pass with the greatest facility; besides which it possesses the power of swimming and diving, both of which materially aid its escape. Without denying the possibility of this bird being migratory, we have the strongest reason to believe that numbers remain with us during the whole of the year, frequenting during the summer season fen-land, morasses, ponds, and ditches, about which it incubates; resorting, on the approach of winter, to the sides of our large streams and rivers. Its nest is composed of rushes and vegetable fibres closely concealed among herbage, at a little elevation from the water; its nidification in fact closely resembles that of the Moor-Hen. Its eggs are of a yellowish-white colour, marked with spots of red brown. Its food consists of worms, snails, soft insects and their larvæ, which abound in swampy places; vegetable substances also form a part. The young, when first excluded from the egg, are covered with black down, and are observed to be in perfect possession of the powers of swimming, and providing for their own safety and subsistence, remaining however under the parent's care and protection.'

Genus 6, *Crex*, the Crakes. Example, the Corn Crake (*Crex Pratensis*, Bechst.; *Rallus Crex*, Linn.) Locality, Europe. One of our migratory birds.

This is the *Rale de Genet* or *Roi des Cailles* of the French; *Rè di Quaglie* of the Italians; *Wiesen-Knarrer* and *Wachtel-König* of the Germans; *Land-Rail, Corn-Crake, Bean-Crake,* and *Corn-Drake* of the British.

Worms, snails, insects and their larvæ, seeds, and grain, form the food of the Land-Rail. It is very fond of grasshoppers. 'Its habits,' says Mr. Gould, 'are extremely shy and retiring, selecting for its places of abode grassy meadows, fields of young corn, ozier-beds, and marshy-grounds, seldom allowing itself to be seen; and were it not for the peculiar note of the male, which consists of a singular grating monotone—sometimes sounding as it beneath one's feet, and again appearing as if uttered at a distance,—its presence would not be betrayed. In these its favourite places of resort and concealment it carries on the process of incubation, constructing its nest on the ground, and occasionally on small hillocks, the nest being composed of slender flags or grasses; the female laying from eight to twelve eggs, rather less than those of the Moor-Hen, to which, in the markings, they bear some resemblance, of a yellowish-white, covered with dull rust-coloured spots. The young, when hatched, are covered with a blackish down, and are soon able to follow the parent-birds, attaining, by the commencement of the shooting-season, nearly the adult size and plumage.' Its southward migration commences in October, when it passes over to the Continent.

The reader will find the European Crakes beautifully figured in Mr. Gould's 'Birds of Europe.'

RALPH, JAMES, was born at Philadelphia, in what year is not recorded, and passed the earlier part of his life there as a schoolmaster. In 1725 he came to England in company with Benjamin Franklin, and became a contributor to the ministerial journals. Pope mentions him in the first book of the 'Dunciad,' published in 1728.

This same year appeared Ralph's first separate and acknowledged literary performance, a poem, entitled 'Night.' It is to this work that Pope

alludes in the third book of the 'Dunciad,' where he exclaims—

'Silence, ye wolves, while Ralph to Cynthia howls,
And makes night hideous; answer him ye owls!'

He wrote also 'The Fashionable Lady, or Harlequin's Opera,' produced at the theatre in Goodman's Fields, in 1730; and one or two other dramatic pieces, which appear to have been unsuccessful. The greater part of Ralph's publications were political pamphlets on the topics of the day; and he is supposed to have continued to be an active contributor to the public journals to the end of his life. He attached himself latterly to the faction of the Prince of Wales, and obtained a pension, which was withdrawn after the death of the Prince. On the accession of George III. he got another pension, which however he did not long enjoy, for he died of gout at Chiswick, Jan. 24, 1762. His principal work, published anonymously, is a continuation of Guthrie's History, entitled a 'History of England during the Reigns of King William, Queen Anne, and King George I.'

RAMADHA'N, the ninth month in the Arabian calendar, and a sort of Lent observed by the Mohammedans, in obedience to the express command of the Koran. During this month every good Moslem is bound to fast from the first appearance of day-break until sunset.

RAMAZZI'NI, BERNARDO, was born at Carpi, near Modena, in 1633. He took his doctor's degree at Parma in 1659. He practised successively at Carpi and at Modena; and when the university of the latter place was instituted, he was appointed professor of the theory of medicine by the duke Francis II. In 1700 he was invited to the second professorship of medicine at Padua, and in 1708 was raised to the principal chair there, though blind and infirm. He died in 1714.

Ramazzini was a frequent writer and a very warm controversialist both in medical and literary subjects. The works by which he is now best known are 'De Morbis Artificum Diatriba,' 1770, and 'De Abusu Chinæ-Chinæ Diss. Epist.' The whole of Ramazzini's writings were published collectively at Cologne, in 1689, at London in 1717, and at several other places at nearly the same time.

RAMBERT, ST. [Loire.]

RAMBERVILLERS. [Vosges.]

RAMBOUILLET. [Seine-et-Oise.]

RAMEAU, JEAN-PHILIPPE, was born at Dijon, in 1683. It may be presumed that he inherited a taste for music, for his father was so passionately fond of the art, that he taught his children to play from notes before they could read from letters. Rameau, after many wanderings, became organist of the cathedral of Clermont, in Auvergne, and continued long in that city, in which he wrote his 'Traité de l'Harmonie.' He then proceeded to Paris, where in 1722 he published the work, and finally fixed himself. He was soon appointed organist of Sainte Croix de la Bretonnerie.

In 1733, when fifty years of age, he produced his first opera 'Hippolyte et Aricie,' the drama by the Abbé Pellegrin. Of his many succeeding operas, his 'Castor and Pollux,' produced at the Académie Royale de Musique in 1737, is the best; it was represented one hundred times. His 'Dardanus,' his 'Zoroaster,' and other pieces were equally successful. The king created for him the office of cabinet composer. Afterwards he granted him letters of nobility, and named him Chevalier de Saint-Michel. He died in 1764.

RAMENGHI, BARTOLOMEO, called *Il Bagnacavallo*, from the place of his birth, was born in 1484. He was a pupil of Raphael, and one of his principal assistants in the Vatican. After the death of his master he carried the principles of his style to Bologna, and assisted to improve the character of that school. There are, or were, works by Bagnacavallo in San Michele in Bosco, San Martino, Santa Maria Maggiore, and Sant' Agostino agli Scopettini, in Bologna. He died at Bologna in 1542. Giovanni Battista Bagnacavallo, who assisted Vasari in Rome and Primaticcio at Fontainebleau, was the son of Bartolomeo Ramenghi.

RAMILLIES. [Marlborough.]

RAMIRO II., son of Ordoño II., succeeded to the throne of Asturias and Leon by the abdication of his elder brother Alfonso IV., surnamed 'el Monge' (the monk), who, in 930, retired into the monastery of Sahagun. Ramiro rendered himself illustrious by his wars with the Mohammedans, from whom he wrested many considerable districts and towns, thereby extending the limits of the small kingdom founded by Pelayo. [Pelayo.] Scarcely had Ramiro ascended the throne however, than his brother Alfonso, growing weary of monastic life, hastened to Leon with a considerable force to reclaim his throne. He was there invested by Ramiro, who compelled him to surrender, and again consigned him to his monastery, where he was soon after deprived of his eyes. Ramiro died Jan. 5, 950. Some time before his death he abdicated in favour of his son Ordoño, and passed the remainder of his days in religious retirement.

RAMISERAM. [Ceylon.]

RAMMLER. [Germany, vol. vi. p. 643.]

RAMMOHUN ROY, Raja, was born about 1774, in the district of Burdwan, in Bengal. He was a Brahmin by birth, and was trained by his father in the doctrines and observances of his sect; but his opinions seem to have changed at an early age. His father died in 1803, and he then published various books and pamphlets against the errors of the Brahmins, in the native and foreign languages. In order to deprive him of caste, the Brahmins commenced a suit against him, which, after many years of litigation, was decided in his favour.

Of the body of Hindoo theology comprised in the Vedas, there is an ancient abstract called the 'Vedant, or the resolution of all the Veds,' written in Sanscrit. Rammohun Roy translated this work into Bengalee and Hindustanee; and afterwards published an abridgment of it for gratuitous circulation. Of this abridgment he published an English translation in 1816. He was at different times the proprietor or publisher of newspapers in the native languages, in which he

expressed his opinion freely against abuses political as well as religious, especially the burning of widows. In 1820 Rammohun Roy published, in English, Sanscrit, and Bengalee, a series of selections from the New Testament, entitled 'The Precepts of Jesus the Guide to Peace and Happiness.' In 1830 he was engaged by the King of Delhi to make a representation of grievances to the British government, for which purpose the king conferred on him the title of Raja. He arrived at London in April, 1831. The British ministers recognised his embassy and title, though the East India Directors objected to both. His negotiation was successful, and added 30,000*l.* a year to the income of the king. He intended to return to India in 1834, but died near Bristol, Sept. 27, 1833.

Rammohun Roy was acquainted more or less with ten languages—Sanscrit, Arabic, Persian, Hindustanee, Bengalee, English, French, Hebrew, Latin, and Greek. He was a believer in the divine mission of Christ, and seems to have considered the acceptance of the doctrines of Christ to be quite consistent with a belief in the Brahminical religion as it is in the ancient Sanscrit authorities.

RAMPART (probably from Ripa, an embankment, from which is derived the Italian word *Riparo*, and the French word *Rempart*) is, in modern fortification, a mass of earth often nearly 80 feet thick, surrounding a town or a military position, or constituting the faces of an outwork; and its use is to protect the interior of the place or work against any sudden enterprise of the enemy, as well as to give the defenders a superiority of elevation with respect to the works of the besiegers.

The ramparts of ancient fortresses were walls of stone or brick, frequently from 60 to 100 feet high and 20 feet broad, including the galleries formed in them; and round or angular towers were constructed at intervals along the walls. A modern rampart is surmounted by a parapet of earth, on the interior side of which, towards the town, is a nearly level space, varying in breadth from 35 to 40 feet, called the terreplein; and on this the artillery is placed. The exterior and interior sides of the rampart are formed with slopes making angles of about 45 degrees with the horizon: or they are retained by revetments, or walls of brick or stone, nearly upright, the exterior face of the rampart constituting the *escarp* of the ditch in front.

The relief, or height, of a rampart is regulated by the occasional necessity of employing a fire of artillery from the rampart, and, at the same time, a fire of musketry made over the glacis by men stationed in the covered way beyond the ditch in front of the rampart. For this purpose a line of fire from the rampart should pass three or four feet above the crest of the glacis in its front, in order that the wind of the shot may not injure the defenders.

RAMPHASTIDÆ (*Toucans* and *Araçaris*), a family of scansorial birds, of which Gould has published a splendid Monograph.

These richly-coloured birds, the Toucans and Araçaris (genera *Ramphastos* and *Pteroglossus*) appear to be restricted in their geographical range to tropical America, and there they live retired in the deep forests, mostly in small companies. Their flight is straight but laborious, and not graceful; whilst their movements, as they glide rather than hop from branch to branch, are elegant.

Mr. Broderip gives the following account of the habits of a Toucan (*Ramphastos erythrorhynchus*) in captivity. Mr. Swainson, who has seen the Toucans in their native forests, had previously informed Mr. Broderip that he had frequently observed them perched on the tops of lofty trees, where they remained as if watching. This circumstance, joined to others connected with the remains of food found in the stomachs of such as were dissected, induced Mr. Swainson to suspect that these birds were partly carnivorous, feeding upon eggs and young birds, as well as fruits and berries; and that while perched upon these high trees, the Toucans were in fact busily employed in watching the departure of the parent birds from their nests. Mr. Swainson could never catch the Toucans in the fact, nor did anything appear in his dissections to determine with certainty on what they fed. Mr. Such informed Mr. Broderip that he had seen these birds in Brazil feed on the Toucan berry, that he had frequently observed them engaged in quarrels with the monkeys, and that he was certain that the Toucans fed also on eggs, nestlings, &c.

In November, 1824, Mr. Broderip went to see a living Toucan, which was then exhibited in St. Martin's Lane, London. He says, 'After looking at the bird which was the object of my visit, and which was apparently in the highest state of health, I asked the proprietor to bring up a little bird, that I might see how the Toucan would be affected by its appearance.' He soon returned, bringing with him a goldfinch, a last year's bird. The instant he introduced his hand with the goldfinch into the cage of the Toucan, the latter, which was on a perch, snatched it with his bill. The poor little bird had only time to utter a short weak cry: for within a second it was dead, killed by compression on the sternum and abdomen, and that so powerful that the bowels were protruded after a very few squeezes of the Toucan's bill. As soon as the goldfinch was dead, the Toucan hopped with it, still in his bill, to another perch, and placing it with his bill between his right foot and the perch, began to strip off the feathers with his bill. When he had plucked away most of them, he broke the bones of the wings and legs (still holding the little bird in the same position) with his bill, taking the limbs therein, and giving at the same time a strong lateral wrench. He continued this work with great dexterity till he had almost reduced the bird to a shapeless mass; and ever and anon he would take his prey from the perch in his bill, and hop from perch to perch, making at the same time a peculiar hollow clattering noise; at which times I observed that his bill and wings were affected with a vibratory or shivering motion, though the latter were not expanded. He would then return the bird to the perch with his bill, and set his

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foot on it. He first ate the viscera, and continued pulling off and swallowing piece after piece, till the head, neck, and part of the back and sternum, with their soft parts, were alone left: these, after a little more wrenching, while they were held on the perch, and mastication, as it were, while they were held in the bill, he at last swallowed, not even leaving the beak or legs of his prey. The last part gave him the most trouble; but it was clear that he felt great enjoyment; for whenever he raised his prey from the perch he appeared to exult, now masticating the morsel with his toothed bill and applying his tongue to it, now attempting to gorge it, and now making the peculiar clattering noise accompanied by the shivering motion above mentioned. The whole operation from the time of seizing his prey to that of devouring the last morsel lasted about a quarter of an hour. He then cleaned his bill from the feathers by rubbing it against the perches and bars of his cage. While on this part of the subject it may be as well to mention another fact, which appears to me not unworthy of notice. I have more than once seen him return his food some time after he had taken it into his crop, and, after masticating the morsel for a while in his bill, again swallow it; the whole operation, particularly the return of the food to the bill, bearing a strong resemblance to the analogous action in ruminating animals. The food on which I saw him so employed was a piece of beef, which had evidently been macerated some time in the crop. While masticating it, he made the same hollow clattering noise as he made over the remains of the goldfinch. Previous to this operation he had examined his feeding-trough, in which there was nothing but bread, which I saw him take up and reject; and it appeared to me that he was thus reduced from necessity to the above mode of solacing his palate with animal food. His food consists of bread, boiled vegetables, eggs, and flesh, to which a little bird is now added about every second or third day. He shows a decided preference for animal food, picking out all morsels of that description, and not resorting to the vegetable diet till all the former is exhausted.

'It is said that the nerves are very much expanded within the internal surface of the bill in these birds; and independently of the sensual enjoyment which the Toucan above mentioned appeared to derive from palating his prey, I have observed him frequently scratching his bill with his foot, which may be considered as furnishing additional evidence of the sensibility of this organ. While taking his prey he never used his foot for the purpose of conveying it either to his bill or elsewhere. The bill was the sole vehicle and the organ actively employed: the foot merely confined the prey on the perch.

'But there is yet another of the peculiarities of this bird which cannot be passed over in silence. When he settles himself to roost, he sits a short time with his tail retroverted, so as to make an acute angle with the line of his back; he then turns his bill over his right shoulder, nestling it in the soft plumage of the back (on which last the under mandible rests), till the bill is so entirely covered that no trace of it is visible. When disturbed, he did not drop his tail, but almost immediately returned his bill to the comfortable nidus from which on being disturbed he had withdrawn it. He broke a short time ago some of his tail feathers, and the proprietor informed me that before that accident the bird when at roost retroverted his tail so entirely that the upper surface of the tail feathers lay over and came in contact with the plumage of the back; so that the bird had the appearance of a ball of feathers, to which indeed when I saw him he bore a very considerable resemblance. The proprietor informs me that he always roosts in the same way.' ('Zoological Journal,' vol. i.)

In a subsequent volume (ii.) Mr. Vigors gives a very interesting account of a Toucan, *Ramphastos ariel* (Vig.), which he kept in a state of domestication for many years. His observations only confirm those of Mr. Broderip, and need not therefore be repeated in the present place. Within the last few years Toucans have been kept alive in the menagerie of the Zoological Society, and the preceding description of the character and habits of the bird has been abundantly confirmed.

The incubation of most if not all of this family takes place in the holes of trees, a habit that was very early known. With regard to organisation, we can only attend to the structure of the feather-like tongue and the light but enormous beak.

Professor Owen found that the length of the tongue in a full-grown *Ramphastos Toco* was six inches. The posterior ridge, or backward-projecting process, was broad and finely notched, and situated about four lines from the glottis. Anterior to this process, Mr. Owen describes the tongue as being soft and minutely papillose for the extent of four lines, and here he thinks most probably the sense of taste resides: the rest of the organ consists of a transparent horny lamina, flattened horizontally, and supported by the anterior process of the os hyoides, which forms a ridge along the middle of its inferior surface. At about four inches from the extremity of the horny lamina the margins become obliquely notched, and these notches, becoming deeper and closer together towards the extremity, occasion the bristled appearance on each side of the tongue: these bristles were applied to the food in the cases of the captive toucans above recorded.

Mr. Owen observes, that the osseous portions of the mandibles of the Toucan are disposed in a manner adapted to combine with the great bulk of those parts a due degree of strength and remarkable lightness, and the bony structure is consequently of a most beautiful and delicate kind. 'The external parietes,' continues Mr. Owen, 'are extremely thin, especially in the upper beak: they are elastic, and yield in a slight degree to moderate pressure, but present considerable resistance if a force is applied for the purpose of crushing the beak. At the points of the mandibles the outer walls are nearly a line in thickness; at other parts in the upper beak they are much thinner, varying from 1-30th to 1-50th part of an inch, and in the lower beak are from 1-20th to 1-30th part of an inch in thickness. On mak-

ing a longitudinal section of the upper mandible, its base is seen to include a conical cavity, about two inches in length and one inch in diameter, with the apex directed forwards. The walls of this cone consist of a most beautiful osseous network, intercepting irregular angular spaces, varying in diameter from half a line to two lines. From the parietes of this cone a network of bony fibres is continued to the outward parietes of the mandible, the fibres which immediately support the latter being almost invariably implanted at right angles to the part in which they are inserted. The whole of the mandible anterior to the cone is occupied with a similar network, the meshes of which are largest in the centre of the beak, in consequence of the union which takes place between different small fibres as they pass from the circumference inwards. It is remarkable that the principle of the cylinder is introduced into this elaborate structure: the smallest of the supporting pillars of the mandibles are seen to be hollow or tubular when examined with the microscope. The structure is the same in the lower mandible, but the fibres composing the net-work are in general stronger than those of the upper mandible.'

Genus *Ramphastos*. — Bill smooth. Nostrils entirely concealed, and placed at the edge of the thickened frontlet of the bill. Wings short, rounded; the four outer quills graduated and abruptly pointed. Tail short, rounded.

Ramphastos Toco appears to be one of the largest species, being 27 inches in total length. The bill measures 7½ inches; the wings, 10; the tail, 7; and the tarsi are 2 inches in length. A beautiful figure of the bird, by Lear, is given in Mr. Gould's magnificent work. The range of the species is very wide, perhaps wider than that of any other, being distributed throughout the whole of the wooded districts from the River Plata to Guiana.

We select as an illustrative example *Ramphastos Cuvieri*.

Toucan (*Ramphastos Cuvieri*).

Genus *Pteroglossus*. — Bill smooth, less compressed. Nostrils vertical, naked, round, pierced on the upper surface of the bill, on the edge of the frontlet. Wings short, rounded. Tail lengthened, graduated.

The following may be taken as examples of the genus:—Humboldt's Araçari (*Pt. Humboldtii*), locality, Brazil, and *Pteroglossus pluricinctus*, also from Brazil.

Araçari (*Pteroglossus pluricinctus*).

RAMPION (*Campanula Rapunculus*) is a biennial plant, indigenous to Britain as well as to various parts of the continent of Europe. It has a long white spindle-shaped root, which may be eaten in its raw state, like a radish, and is by some esteemed for its pleasant nutty flavour. Both leaves and root may also be cut into winter salads. The seeds should be sown at the end of May, in rather light soil, and thinly covered. The roots will be fit for use throughout the following winter.

A different plant, the *Œnothera biennis*, is sometimes called German Rampion. Its roots are used like those of the above, and the plants are cultivated in the same manner as carrots or parsnips.

RAMPOOR, a town of Hindustan, in the district of Bareilly, province of Delhi, and presidency of Bengal, on the east bank of the Cosila River, in 28° 48′ N. lat., and 79° E. long., 105 miles E. by N. from Delhi, direct distance. The town, at the time of the death of Fyzoola Khan, a Rohilla chief to whom it had been secured by the peace of Lalldong in 1774, was four miles in circumference and the centre of a flourishing district, but has since been greatly reduced. The district was granted to the nawâb of Oude on the termination of the Rohilla war, and the town was ceded to the British in 1801, by whom it was transferred to the nawâb of Rampoor, together with a small territory.

Rampoor is chiefly remarkable for the curious kind of fortification by which it is surrounded, a high and thick hedge of bamboos faced on the outside by a prickly underwood of cactus and bâbool. The entrances are by narrow passages, defended by strong wooden barriers. It is said to be an extremely effective defence against irregular troops, since neither cavalry nor infantry

can be brought to act against an enemy whom they cannot see, and who is firing at them from among the close stems of the bamboos, and under cover of the almost impenetrable hedge on the outside.

RAMSAY, ALLAN, was born in 1685, at a small hamlet on the banks of the Glangonar, a tributary of the Clyde, among the hills that divide Clydesdale from Annandale, and was apprenticed to a barber in Edinburgh early in the last century. In course of time however he exchanged this trade for that of a bookseller. His convivial qualities gained for him the acquaintance of many distinguished persons both in the literary and fashionable circles; and in 1721 he published a volume of his poems, which was very favourably received. In 1724 he published 'The Evergreen, being a Collection of Scots Poems, wrote by the Ingenious before 1600.' The materials for this collection were chiefly obtained from the Bannatyne MS., preserved in the Advocates' Library; but Ramsay has patched and renovated the old verses throughout to suit his own fancy. 'The Evergreen' was followed the same year by 'The Tea-Table Miscellany, or a Collection of Choice Songs, Scots and English,' in four volumes, which has been often reprinted. Ramsay afterwards wrote many more verses in his native dialect; but his chief performances are his comic pastoral, the 'Gentle Shepherd,' published in 1729, and his continuation of the old Scottish poem of 'Christ's Kirk on the Green,' attributed by some to James I.; by others, with more probability, to James V. Ramsay died in 1758.

RAMSAY, ALLAN, a portrait painter, and son of Allan Ramsay the poet, was born in 1713, in Edinburgh. 'Ramsay,' says Edwards, 'may be called self-taught; but he studied a short time in Italy with Solimena, and F. Fernandi, called Imperiali.' After practising a short time in Edinburgh, he settled in London, where he was introduced by Lord Bute to George III. when Prince of Wales. He painted two portraits of the Prince. At the death of Mr. Shakelton, in 1767, Ramsay succeeded him as principal painter to the king. He retained the place until his death, when he was succeeded by Sir Joshua Reynolds. He died at Dover in 1784, on his return from a fourth visit to Rome. Ramsay, though not an excellent portrait painter, was superior to the generality of the painters of his time. Walpole says, 'Reynolds and Ramsay have wanted subjects, not genius.'

RAMSAY, ANDREW MICHAEL, generally known as the Chevalier Ramsay, was born at Ayr, in Scotland, in 1686. He was educated at Edinburgh, where he chiefly devoted himself to mathematics and theology. Having entertained some doubts respecting the tenets of the Protestant faith, he went to France, and formed the acquaintance of Fénélon, Archbishop of Cambray, who converted him to Romanism. Ramsay rapidly acquired so perfect a knowledge of the French language as to become an excellent writer. Some of his productions were the means of obtaining for him the situation of tutor to the Duke of Château-Thierry and afterwards to the Prince of Turenne; he was also created a knight of the order of St. Lazarus. His reputation induced the Pretender, in 1724, to invite him to Rome, and to entrust him with the education of his children. The next year he revisited Scotland, where he remained a considerable time, which he employed in literary labour. On visiting England, he obtained the degree of doctor of civil law in the University of Oxford; and was admitted a member of the Royal Society of London. After his return to France he was appointed intendant to the Prince of Turenne; and he held this situation till his death, which took place at St. Germain-en-Laye in 1743.

The writings of the Chevalier Ramsay are more remarkable for purity of style than for depth or originality of thought. As a theologian he was visionary in the extreme, and his orthodoxy, even according to the principles of the church he had adopted, is open to considerable suspicion. The work by which he is best known, is his 'Voyages de Cyrus,' an imitation of the 'Télémaque' of Fénélon. The work however for which posterity is most indebted to him is that entitled 'L'Histoire de la Vie de François de Salignac de la Motte Fénélon,' Hague, 1723; published also in London the same year.

RAMSDEN, JESSE, was born at Salterhebble, near Halifax, Yorkshire, in 1735. At the age of 20 we find him engaged as a clerk in a cloth warehouse in London, in which capacity he continued till 1757–8, when his predilection for other pursuits led him to bind himself for four years to a working mathematical and philosophical instrument maker. He commenced working on his own account, and his skill as an engraver and divider gradually recommended him to the employ of the leading instrument-makers. Ramsden subsequently married Dollond's daughter, and he received with her a part of Mr. Dollond's patent right in achromatic telescopes. His occupation afforded him frequent opportunities of observing the defective construction of the sextants then in use, the indications of which, as had been pointed out by Lalande, could not be relied on within five minutes of a degree, and might therefore leave a doubt in the determination of the longitude amounting to fifty nautical leagues. The improvements introduced by Ramsden are said by Piazzi to have reduced the limits of error to thirty seconds. This circumstance, added to the cheapness of his instruments, which were sold for about two-thirds the price charged by other makers, soon produced a demand which, even with the assistance of numerous hands, he found difficulty in supplying. In his workshops the principle of the division of labour was carried out to a considerable extent, and a proportionate dexterity was acquired by the workmen; but it is asserted that in none of these, even the most subordinate, and least of all in the higher departments, did the skill of the workmen surpass that of Ramsden himself. His attention was incessantly directed to new improvements and further simplification, the result of which was the invention of a dividing-machine. From this time his fame was fully established as the first instrument-maker of his day. He died in 1800.

RAMSEY. [Man, Isle of.]

RAMSEY. [Huntingdonshire.]

RAMSGATE. [Kent.]

RAMSON (*Allium ursinum*), a species of garlic found wild in many parts of Britain, and formerly cultivated in gardens; but its use has been superseded by the *Allium sativum*, a native of Sicily, which is the Garlic now in cultivation.

RAMTILLA, a genus of plants of the natural family of *Compositæ*, and subtribe *Helianthæ*. The plant is remarkable for the number of names by which it has been described by botanists. Of these we need only mention the *Verbesina sativa* of Roxburgh, and the *Ramtilla oleifera* of De Candolle. This plant is cultivated in different parts of India, from October to March, in fields, for the sake of the seed, from which an oil is expressed, and used as a substitute for that of the Sesamum, which is considered the best kind. It is used both in dressing food and as a lamp oil.

RAMUS, PETER (PIERRE DE LA RAME'E), was born in Picardy, in 1502, according to one account, and in 1515 according to another. His parents were extremely poor, and he was sent when a boy to tend sheep. Having an ardent desire to get knowledge, he ran away from his parents to Paris, and at last entered the college of Navarre as a servant. He made great progress in all studies, with very little assistance. When he presented himself for his degree, he undertook as an exercise the task of showing that Aristotle was not infallible. This was the beginning of the anti-Aristotelian opinions by which Ramus gained his fame. In 1543 he published his new system of logic, with strictures on the logic of Aristotle. The publication of this work exposed him to great obloquy; and the king ordered his works to be suppressed, and forbade his teaching or writing against Aristotle on pain of corporal punishment. Ramus availed himself of his leisure to study mathematics and prepare an edition of Euclid. In 1551 he was named by the king (Henri II.) professor of philosophy and eloquence in the College of France. During the next ten years he published a Greek, a Latin, and a French grammar, and several treatises on mathematics, logic, and rhetoric. Ramus, who had embraced Protestantism, brought trouble upon himself by the zeal with which he advocated the new doctrines. Charles IX. offered him an asylum at Fontainebleau; but while he was absent from home, his house was pillaged and his library destroyed. He returned to Paris in 1563, and resumed possession of his royal chair. Civil troubles again drove him away from Paris, and in 1568 he went to Germany, and gave lectures on mathematics at Heidelberg, where he made public profession of Protestantism. Shortly after his return to Paris, he fell a victim in the massacre of St. Bartholomew.

Although Ramus had many merits as a philosopher, and did good by his opposition to the Aristotelian philosophy, which then held men's minds in bondage, he was wanting in depth and caution, and his strictures on Aristotle are by no means altogether just. He had many followers. France, England, and particularly Scotland, were full of Ramists. Andrew Melville introduced the logic of Ramus at Glasgow.

RAMU'SIO, GIAMBATTISTA, was born at Treviso in the Venetian State, in 1485. He filled several offices under the republic, and became secretary to the Council of Ten. Having undertaken a collection of the most important narratives of voyages and travels performed in distant countries both in ancient and modern times, he translated into Italian those that had been written in other languages, and added his own remarks and several dissertations, which show that he possessed very extensive general information for the age in which he lived. He was a friend of Bembo, Fracastoro, and other learned contemporaries. His work is entitled 'Raccolta di Navigazioni e Viaggi,' 3 vols. folio. The first volume was printed by Giunti at Venice, in 1550; another volume appeared in 1556, and a third in 1559, after Ramusio's death, which took place at Padua, in July, 1557. The most complete edition is that of 1606.

Ramusio left materials for a fourth volume, which were destroyed in a fire which broke out in the printing-office of Giunti, in Nov. 1557.

RANCE. [Côtes-du-Nord.]

RANDERS, a town in North Jutland, is situated in 56° 28′ N. lat., 10° 3′ E. long., near the Baltic, on the river Guden, which is here navigable. It is a walled town with seven gates, and next to Aarhuus, is the most considerable place in Jutland, having a population of 5600. The inhabitants manufacture gloves, stockings, woollen cloths, earthenware, beer, spirits, sugar, and lampblack. Salmon fishing is carried on, and there is a brisk trade in corn.

RANDIA, a genus of plants belonging to the natural order *Rubiaceæ*. *R. dumetorum*, Bush-Randia, has a fruit which, when bruised and thrown into water, intoxicates or even kills fish, having the same effect as the *Cocculus Indicus*, which is not however known in the East Indies, where this plant grows. In the form of powder it is a powerful emetic. An infusion of the bark of the root is employed to nauseate in bowel complaints. *R. uliginosa*, Bog-Randia, is a native of the East Indies, in moist places. The flowers of this species render it deserving of a conspicuous place in the hothouse. There are 39 species of *Randia*, none of which however are applied to any useful purpose.

RANDOLPH, THOMAS, an English poet, was born in 1605, at Badby, in Northamptonshire. He was educated at Westminster School, and elected scholar of Trinity College, Cambridge, in 1623. He was afterwards made fellow on the same foundation, and admitted to an ad eundem degree at Oxford in 1631. In London he was noticed by Ben Jonson, who called him his adopted son. The promise of his youth was marred by a career of dissipation and extravagance, which shortened his life. He died at Blatherwick in Northamptonshire, March 17, 1634–5.

Randolph's 'Poems, Translations, and Plays,' were published in London, 1634, 4to.; and his 'Poems, with the 'Muses' Looking-Glass' and

'Amyntas,' at Oxford, in 1638, 4to. He wrote also several plays, of which the best is 'The Muses' Looking-Glass,' Lond. 1638, 4to.

Randolph's writings are the production of a mind imbued with classical literature, but they are often disfigured by licentiousness, obscurity, and strained conceits, exhibiting more learning and ingenuity than good taste.

RANELAGH. [DUBLIN.]

RANGER (*Rangeator*), an ancient officer in the king's forests and parks, appointed by patent, and enjoying certain fees, perquisites, and other advantages. His duty was of three kinds: 1, to make daily perambulations, to see, hear, and inquire concerning any wrong doings in the limits of his bailiwick; 2, to recover any of the beasts which have strayed beyond the limits of the forest or chase; and 3, to present all transgressions at the next forest court.

RANGOON is the most commercial port of the Birman Empire. It is near 16° 40′ N. lat. and 96° 18′ E. long., and is built on the most eastern branch of the river Irawaddi, about 26 miles from the sea.

The town is on the left bank of the river. The town and suburbs extend about a mile along the bank of the river, but the houses are very unequally scattered over this area. The streets are narrow, but clean and well paved. The houses are raised on posts, the smaller supported by bamboos and the larger by strong timbers. The myo, or city, is an irregular quadrangle, surrounded by a stockade 14 feet high, and composed of heavy beams of teak timber. The north and south faces of this stockade are 1145 yards long; the east 598, and the west 197 yards. It has in some places a stage to fire musketry from, through embrasures or loop-holes. On the south side of the stockade towards the river is a ditch, over which there is a causeway. In the interior of the stockade are three wide streets running east and west, and three smaller ones crossing them and fronting the gates on the south face.

Two narrow roads, paved with brick, lead from the southern face of the stockade to the great pagoda, Shewi Dagong, and along the sides are built a number of *sidis*, or monuments in honour of Buddha. The Shewi Dagong is richly gilt all over. It is said to be about 278 feet high, and is surrounded by an inclosure, in which is an immense bell of very rude fabric.

Rangoon was built by Alompra, after the destruction of Pegu and Syrian, in 1755. It has risen to be a place of much commercial importance. Ship-building is carried on to a considerable extent. Much commerce is maintained with neighbouring countries, especially with Chittagong, Dacca, Calcutta, Madras, Masulipatam, the Nicobar Islands, and Pulo Penang; there is also some trade with Bombay and the Persian and Arabian gulfs. The population is estimated at about 10,000.

RA'NIDÆ. [FROGS.] The reader should refer to Mr. Bell's interesting 'History of British Reptiles,' where the experiments of Edwards, proving the existence of cutaneous respiration in the frog after the possibility of communication with the lungs was prevented, are recorded, and many very valuable remarks are concentrated.

RANINIANS, the name by which M. Milne Edwards designates the fourth tribe of the family *Apterura*, belonging to the section of *Anomourous Decapod Crustaceans*.

This tribe, in its general form and in the conformation of its feet, approaches very closely to the Hippians, and especially to the *Albuneæ*. [HIPPA.]

RANSOM, a word common to the French (rançon) and English languages, the sense of which is a sum of money paid for the redemption of a captive.

The paying of ransoms is an event of frequent occurrence in the middle-age history, and indeed may be traced in the history of the older nations. In modern warfare we hear little of ransoms. When prisoners are to be redeemed, it is usually done by way of exchange, and those who remain over, at the conclusion of a war, are usually delivered up as a part of the concession of the party in whose favour the difference is found to be.

In the indentures of military service in the middle-age period, it was a usual stipulation that, while the ransom of persons of inferior condition taken in the war was allowed to those by whom they were captured, the ransom for persons of rank was to belong to the king.

RA'NULA is a tumour formed beneath the tongue, and probably resulting from an obstruction of one or more of the ducts of the sublingual salivary glands. The tumour is usually of a rounded form, with a smooth polished surface similar to that of the adjacent mucous membrane. When small, such a tumour produces so little inconvenience, that it is usually not discovered till it has existed for some time. As they increase in size however, these growths, though seldom attended with pain, produce great inconvenience, by obstructing all the movements of the tongue. They usually burst when they have attained the size of a walnut, but they sometimes continue to increase beyond this size, and have been seen large enough to contain a pint of fluid.

RANUNCULA'CEÆ form a tribe of plants founded on the common Crow-Foot, or Buttercup, but embracing a large variety of different structures within its limits. All are more or less acrid and poisonous, and some vehemently so, as aconite and hellebore; others are beautiful with their gay flowers, as the pæony, ranunculus, larkspur, and columbine: many however are mere weeds.

RANUNCULUS a genus of plants, the type of the natural order *Ranunculaceæ*. The species are mostly acrid, and if applied when fresh to the skin will produce blisters: this quality is destroyed by drying or by heat. *R. aquatilis*, Water-Crow-Foot, is native throughout Europe, Western Asia, North Africa, and also in America and England, in pools and stagnant waters. *R. flammula*, Flame-Crow-Foot, is native of Europe, Asia, North America, and Great Britain. *R. glacialis* is native of the higher Alps of Europe, among rocks, near the limits of perpetual snow, and of Lapland and Iceland. *R. acris*, Buttercup, is

extremely acrid and dangerous. Mr. Curtis says that even pulling up the plant and carrying it to some little distance has produced inflammation in the hand. Cattle in general will not eat it, but sometimes when they have been turned hungry into a field they have fed upon it, and in consequence their mouths have become sore and blistered. According to Linnæus sheep and goats eat it, but cows, horses, and swine, refuse it. When made into hay however, its noxious qualities are lost. It is commonly called Buttercup, under a notion that the yellow colour of butter is owing to these plants. A double variety of this species is cultivated in gardens under the name of Bachelor's Button. *R. sceleratus*, Celery-Leaved Crow-Foot, is one of the most virulent poisons of our native plants. The distilled water of this species is highly acrimonious, and when cold deposits crystals which are scarcely soluble, and are of an inflammable nature. The deleterious qualities are however dispelled by decoction, and accordingly the shepherds of Wallachia boil and eat it. *R. Thira*, is native of the Alps of Europe. It is said to yield the juice formerly used by the Swiss hunters to poison their darts; wounds from such weapons speedily became fatal. *R. ficaria*, Pilewort, is native throughout the whole of Europe in meadows, bushy places, and about hedge-banks; it is plentiful in Britain. A notion that the root is efficacious in the cure of piles gives it its common English name. *R. arvensis*, Corn-Crow-Foot, is native throughout Europe, in North America, and Great Britain. It is very acrid and dangerous to cattle, though they are said to eat it greedily. *R. Asiaticus*, common Garden Ranunculus, is a native of the Levant. The Garden Ranunculus is a florist's plant, and has been cultivated with great care. The garden varieties of this species are very numerous, as no two plants produce flowers precisely alike.

RAPALLO. [GENOA.]

RAPE is defined to be the having unlawful carnal knowledge of a woman by force and against her will; and it is a capital felony. A person under fourteen years of age is in law presumed to be incapable of perpetrating this offence: this presumption however is based on physical grounds entirely, so that such a person, by assisting others of maturer age, may render himself liable to the full penalty of the law as a principal in the second degree. In the case of a female under ten years of age, whether the act takes place with or without her consent, it is equally punishable as rape; if she be above ten and under twelve years of age, her consent reduces the act to a misdemeanor punishable by imprisonment and hard labour for such term as may be awarded.

An assault with intent to commit a rape is a misdemeanor punishable by imprisonment for any term not exceeding two years, and with or without hard labour, at the discretion of the court before which the offender is convicted. Upon a trial for the capital offence, where the evidence is incomplete, the prisoner may be convicted of a misdemeanor.

RAPE (*Brassica napus*). This plant, which is of the cabbage tribe, is cultivated like Cole, or Colza (*Brassica napus sativa*), for the sake of its seeds, from which oil is extracted by grinding and pressure. It is also extensively cultivated in England for the succulent food which its thick and fleshy stem and leaves supply to sheep when other fodder is scarce.

The mode of cultivation of the colza and rape for seed is nearly the same. The colza takes a longer time to come to maturity, and produces more seed. The rape grows on less fertile soils, and may be sown in spring as well as in autumn. Both are hardy, and resist the winter's frost.

RAPHAEL, or RAFFAELLO SANZIO, was born at Urbino, March 28, 1483. He was the son of Giovanni Sanzio, a painter of some merit, from whom Raphael learned the rudiments of his art. At what age Raphael became the pupil of Perugino we know not, but traces of the scholar's hand are supposed to be visible in the frescoes of the Cambio at Perugia, painted about 1500.

The career of Raphael is usually divided into three periods, of which the first terminates with his visit to Florence, in the autumn of 1504; the second comprises the time from that date until he was invited to Rome by Julius II., about the middle of 1508; and the third extends to his death, in 1520.

Of the works executed before Raphael's visit to Florence, one of the earliest extant is probably the Virgin with the Book, in the Berlin Gallery, and a still more important picture of this period is the Adoration of the Magi, in the same collection. The pictures painted at Città di Castello were, the Coronation of St. Nicholas of Tolentino; the Sposalizio, or Marriage of the Virgin; and the Christ on the Cross. Raphael's share in the frescoes executed by Pinturicchio has been much exaggerated: he only furnished some drawings, two of which are yet extant. Four pictures of the Virgin and Child of Raphael's Florentine period are distinguished by different characters, though all are exquisitely beautiful. The Madonna del Gran Duca, in the Pitti Palace, is the most simple, and, to our judgment, the most admirable of them all. To the same time must be attributed the Madonna del Cardellino, in the Tribune at Florence, the Belle Jardinière at Paris, and the Holy Family with the Palm, in the Bridgewater collection. Raphael's power and fidelity as a portrait painter are well shown in the beautiful portraits of Angelo and Maddalena Doni, in the Pitti Palace, and in two heads of monks, in the Academia at Florence. The St. Catherine, now in the National Gallery of London, was executed in the latter part of the artist's residence at Florence. The two works which must be considered as closing this division, are the Madonna del Baldacchino, or di Pescia, left unfinished when the painter started for Rome, and the Entombment of Christ.

Raphael seems to have left Florence rather suddenly towards the end of the year 1508, having been invited to Rome by Julius II. The Stanze decorated by the pencil of Raphael were the apartments of the papal court in the time of Leo X. His frescoes suffered during the occupation of Rome by the Imperial troops, in 1527, and by subsequent neglect, when the popes had

transferred their residence to the Quirinal. In the years 1702 and 1703 they were cleaned and restored by Carlo Maratti, who repainted the larger portion of the decorative framework. The Cartoons for the tapestry to be hung round the Sistine Chapel were prepared in 1515 and 1516, at the desire of Leo X. [CARTOONS.] The Isaiah, in San Agostino, was probably painted in 1512 or 1513; and the Sibyls, in Santa Maria della Pace, shortly afterwards.

Vasari says that his portrait of Julius II. was so like as to inspire fear, as if it were alive. The original thus spoken of is supposed to be in the Tribune at Florence. Two copies of it are in the Pitti Palace, and one in our own National Gallery. On the subject of Raphael's own portrait a good deal of controversy has taken place; but we believe the picture now at Munich to be the work of Raphael, and his own portrait. Three portraits exist, which are believed to represent Raphael's mistress, the so-called Fornarina, painted by himself. One of these is in the Barberini, another in the Sciarra Palace at Rome, and the third is in the Tribune at Florence. This last picture bears the date of 1512, and was at one time attributed to Giorgione. The Madonna della Seggiola, the Madonna del Duca di Alba, and several others of somewhat similar feeling, belong to the time of Raphael's residence at Rome. The St. Cecilia, at Bologna, was ordered about 1510, and completed somewhat later; it has suffered greatly from restoration.

The four great altar-pieces of Raphael's later time are—The Madonna del Pez, painted for San Domenico at Naples, but afterwards removed to the Iglesia Vieja of the Escurial; the Madonna di S. Sisto, the well-known pride of the Dresden gallery; the Spasimo di Sicilia, executed for Santa Maria dello Spasimo, at Palermo, now in the public gallery at Madrid; and the Transfiguration, usually considered to be Raphael's masterpiece. It was left unfinished at his death.

In addition to his numerous paintings Raphael occupied himself with sculpture. The Psyche and the Galatea, executed in the Farnesina at Rome for Alessandro Chigi, are his principal works which represent mythological subjects.

Raphael died April 6, 1520, of fever, at the age of 37.

All that is recorded of his public and private character represents him as very amiable, and as the object of sincere affection on the part of his immediate friends. As an artist he attained the highest degree of excellence in each of the three styles which he adopted at different periods of his life, and his latter works are confessedly superior to those of any other painter.

RA'PHANUS, a Brassicaceous or Cruciferous genus of plants, is only remarkable for containing the common Radish, *Raphanus sativus*. This plant, a native of China, has been cultivated in this country for upwards of 250 years, and has given rise to numerous varieties. They are also denominated spring, summer, autumn, or winter radishes, according to the season in which the respective sorts are found best adapted for use.

If the early white Turnip-Radish be sown in August, it will come into use in autumn. The principal sowings should however be made in January and February, and successionally till May. The winter varieties require to be sown in July. In cold frosty weather the beds should be protected by straw, as is commonly practised, or by such other efficient means as may be at command. The covering should be always dispensed with when the days are fine; but it ought to be replaced before the cold of night ensues. Radish seed-pods are sometimes pickled, whilst tender, and may be used instead of capers, when the latter cannot be obtained.

RAPHOE. [DONEGAL.]

RAPIN DE THOYRAS, PAUL, was born at Castres, in Languedoc, in 1661, of a Protestant family originally from Savoy. The revocation of the Edict of Nantes, in 1686, drove him from his native country, and he went first to England and afterwards to Holland, where he entered the service of William of Nassau as a volunteer. He accompanied William to England in 1688, was made an officer in an English regiment, served in Ireland under General Douglas, and was wounded at Limerick. Not long after he was appointed travelling tutor to the young Duke of Portland, with whom he spent several years. Having completed his engagement, he retired with his wife first to the Hague, and afterwards to Wesel, where he commenced his great work, the 'History of England,' which occupied him for seventeen years. He died at Wesel in 1725. The work was translated into English by Nicholas Tindal. Rapin wrote also a 'Dissertation sur les Whigs et les Torys.'

RAPTATO'RES, Illiger's name for his third order of birds, comprehending the *Birds of Prey*.

His *Raptatores* consist of the following families and genera:—

Nocturni.—*Strix*.

Accipitrini.—*Falco, Gypogeranus, Gypaëtus*.

Vulturini.—*Vultur, Cathartes*.

This order is placed by Illiger between the *Ambulatores* and *Rasores*.

The *Accipitres*, Linnæus's first order, include the genera *Vultur, Falco, Strix*, and *Lanius*.

RAPTO'RES, the name assigned by Mr. Vigors to the *Birds of Prey*. [RAPTATORES.]

The *Raptores* of Mr. Vigors form his first order, and the following families are arranged by him under it:—*Vulturidæ, Falconidæ, Strigidæ, Gypogeranidæ*.

The *Raptores* of Mr. Swainson comprise the families of *Vulturidæ, Falconidæ*, and *Strigidæ*.

Mr. G. R. Gray also makes the *Raptores* consist of the families *Vulturidæ, Falconidæ*, and *Strigidæ*.

RAREFACTION is an augmentation of the intervals between the particles of aeriform fluids, so that the same number of particles are made to occupy a volume greater than that under which they were previously contained. The term is used in opposition to condensation, and in the same sense as dilatation, which last is applied both to fluids and solids. Rarefaction or dilatation is caused by a repulsive power existing either in the

particles of bodies or in those of the caloric between them, by which power the particles are made to recede from one another when not prevented by some external resistance.

From the experiments of M. Gay-Lussac and Dr. Dalton it has been ascertained that, under equal external pressures, the rarefactions of all dry gases and of the aëriform substances produced by the evaporation of liquids are equal at equal temperatures, between the points of freezing and boiling water, and that they vary in volume proportionally to the increments of heat expressed by the expansions of mercury in the thermometer.

The experiments of Lavoisier and Laplace have shown that, between the temperatures of freezing and of boiling water, the dilatations of all metals and of the fluids called non-elastic are constantly proportional to the increments of temperature; but, beyond the temperature of boiling water, the experiments of Dulong and Petit indicate that the dilatations increase in a higher ratio. A remarkable circumstance is observed in the state of water when near congelation. On being cooled to a temperature within the limits of 33.9° and 34.5° (Fahrenheit), its volume remains stationary, and in this state water seems to have attained its maximum of density; for, on continuing the cooling process, the water begins to expand, and it continues to do so until it is converted into ice.

RAS-EL-HAD. [Arabia.]

RASHES. [Exanthemata.]

RASK, RASMUS CHRISTIAN, was born on the 2nd of November, 1787, at Brendekilde, near Odense, in the island of Fyen, or Fünen, in the kingdom of Denmark. His parents were poor, but the boy's talents procured him friends who enabled him to prosecute his favourite studies in the university of Copenhagen. He afterwards spent some time in Iceland, and made journeys to Sweden, Finland, and Russia, for the purpose of increasing his knowledge of languages. In 1808 he obtained a situation connected with the university library at Copenhagen; and devoted himself to comparative philology. He undertook in 1817, with the support of the Danish government, a journey to Russia, whence he proceeded in 1819 to Persia. He made some stay at Teheran, Persepolis, and Shiras, and in 1820 went to India, from whence he returned in 1822 to his native country. In this expedition he purchased for the Copenhagen Library 113 ancient and rare oriental manuscripts. Soon after his return he was appointed professor of the history of literature in the university of Copenhagen. As president of the Icelandic Society of Literature, and of the Society for the Investigation of Northern Antiquities, he took an active part in the journals of both societies. In 1829 he was appointed professor of oriental languages, and chief librarian of the university library. His attention was now confined almost exclusively to the eastern languages, but his edition of Lokman's 'Fables,' 1832, shows that he was imperfectly acquainted with Arabic. Indeed, so far as concerns the oriental languages, his skill rather lay in general comparisons and grammatical investigations, than in an exact knowledge of them. In his knowledge of the northern languages he was unrivalled. He died at Copenhagen, 14th November, 1832. One of his best works, an Anglo-Saxon Grammar, has been translated into German and English. For further information as to his works, see *Zeitgenossen*, third series, No. xxxvii.

RASO'RES. The *Rasores* of Illiger contained the following families and genera:—

Gallinacei.—*Numida*, *Meleagris*, *Penelope*, *Crax*, *Opisthocomus*, *Pavo*, *Phasianus*, *Gallus*, *Menura*, *Tetrao*, and *Perdix*.

Epollicati.—*Ortygis* (*Turnix*), *Syrrhaptes*.

Columbini.—*Columba*.

Crypturi.—*Crypturus* (*Tinamus*, Lath.).

Inepti.—*Didus*.

The order, which is the fourth in Illiger's method, is placed between the *Raptatores* and *Cursores*.

The *Rasores* of Mr. Vigors consist of the families *Columbidæ*, *Phasianidæ*, *Tetraonidæ*, *Struthionidæ*, and *Cracidæ*.

The *Rasores* of Mr. Swainson comprehend the families *Pavonidæ*, *Tetraonidæ*, *Struthionidæ*, *Columbidæ*, and *Megapodiidæ*.

The *Rasores* of Mr. G. R. Gray embrace the families *Cracidæ*, *Phasianidæ*, *Tetraonidæ*, *Chionidæ*, and *Tinamidæ*.

RASPBERRY, *Rubus Idæus*, is a native of Britain and other parts of Europe. The best soil for raspberries is a light rich loam. They will thrive well in sandy peat, provided it is not too dry. In all cases the ground for a plantation should be well trenched and manured previous to planting. Pruning should be performed in autumn. All dead parts must be cleared off, and only a few of the strongest summer shoots retained, and in the next summer they will bear fruit. The ground of a raspberry plantation should be kept loose and supplied with well-rotted manure, but in so doing a fork should be used in preference to a spade. Notwithstanding the best management in these respects, it becomes advisable to make a new plantation in fresh soil after four or five years. The fruit of the raspberry is extensively used in a variety of ways, both by the cook and the confectioner, and also in the preparation of cordial spirituous liquors. [Fruits.]

RASTADT, a fortified town, with 5680 inhabitants, in the grand-duchy of Baden, is situated on the river Murg, near the right bank of the Rhine, at a distance by railway of 14 miles S. from Carlsruhe, and 26 N. by E. from Strasburg. It is regularly built. Among the public structures is a fine palace, built on the model of that of Versailles, and till 1771 the residence of the margrave of Baden. There are 3 churches, 2 chapels, a lyceum, and a training-school for catholic schoolmasters. Starch, snuff, tobacco, chicory, papier-mâché articles, fire-arms, mathematical and philosophical instruments, and carriages, are manufactured. Rastadt has been the scene of important negotiations. On March 6, 1714, Prince Eugene and Marshal Villars signed a treaty of peace in this town, which put an end to the war of the Spanish succession. On the 9th of December, 1797, a congress was assembled at Rastadt, to negotiate a peace between France and the German

Empire. Roberjeot and Bonnier, the French ambassadors at this congress, which was dissolved by the emperor April 7, 1799, were murdered on their way home, at about 500 paces outside the town: no satisfactory evidence was ever obtained respecting the authors of the crime. During the late rebellion in Baden, the republican insurgents having suffered various defeats from the auxiliary Prussian troops, shut themselves up in Rastadt, which, after about a month's siege by the Prussians under the Prince of Prussia, surrendered unconditionally, July 23, 1849.

RASTALL, or RASTELL, JOHN, one of our early printers, is said to have been a citizen of London. The first work which bears his name as printer, with a date, was published in 1517, the last in 1533. There are numerous others without dates. His residence was at the sign of the Mermaid, at Paul's Gate next Cheapside. He married Elizabeth, sister to Sir Thomas More.

Bale and Pits ascribe the authorship of various works to John Rastall; the most remarkable of which is his 'Anglorum Regum Chronicon, or Pastyme of People,' a work of extreme rarity, reprinted in 1811 in the 'Collection of English Chronicles.' He compiled several law-books. Of these, his 'Exposition of Law Terms and the Nature of Writs,' and the book called 'Rastall's Entries,' continued long in use.

Wood says that Rastall, by frequent conferences with Sir Thomas More, improved his knowledge in various sorts of learning, which is probable; but he omits to notice, that Rastall became a convert to the reformed religion by means of a controversy with John Frith. Rastall died in London in 1536.

RASTALL, WILLIAM, son of John Rastall, was born in London, in 1508, and about 1525 was sent to Oxford, which he left without taking a degree, and entered at Lincoln's Inn, where he became autumn or summer reader; but on the change of religion, he retired with his wife to Louvain, whence he returned on the accession of Queen Mary. In 1554 he was made a serjeant-at-law, one of the commissioners for the prosecution of heretics, and one of the justices of the Common Pleas. Queen Elizabeth renewed his patent as justice, but he preferred retiring to Louvain, where he died, Aug. 27, 1565.

Rastall for some years seems to have carried on the business of a printer, in conjunction with his practice as a lawyer. When Justice Rastall, he published 'A Collection (abridged) of the Statutes in Force and Use,' in 1557, often reprinted.

RAT. [Muridæ.] Few animals are more destructive of every kind of grain than rats. When a barn is infested with them, it is scarcely possible to get rid of them. They will leave it for a time, and the farmer imagines that they are all destroyed; but no sooner is the corn brought in than they resume their depredations. There are means however of destroying them, and some of these means are equally effectual and ingenious.

The principle on which all rat-catchers proceed is, to entice the rats to some particular spot, convenient for their future operations. There are some strong scents which these animals seem to delight in; and, by means of these, their natural sagacity is deceived. Oil of rhodium, of carraway, or aniseed, and musk, are great favourites with rats. Rags impregnated with these, and which have not been in contact with any part of the body of a man, being laid, as if by accident, will induce them to come out of their hiding-places in the night, and frequent the spot where the smell attracts them. Gradually they will become familiarised with the place; and pieces of tallow or cheese or malt-dust may be placed near without exciting their suspicion. After they have been fed for a time, they will readily eat anything that may be thrown down, provided it has not been touched by the hand without the covering of a glove properly scented. It will take some time to accomplish this; and when they are to be poisoned, a quantity of poisoned food, similar to what they have been accustomed to feed on, must be prepared, sufficient to poison all those which are supposed to frequent the place. The poisons commonly used are arsenic, nux vomica, powdered Spanish flies, and cocculus indicus, which intoxicates them, so that they may be taken by the hand. A small chamber, or a large chest or box, is convenient to collect the rats; and in order to induce them to go in, pieces of toasted cheese or red-herring are trailed along the ground from the rat-holes to the place where it is wished that they should assemble. As soon as they have been accustomed to find food which they like, they will all come to it in the night; and they can be poisoned, or caught by some contrivance by which the only entrance to the place or box can be suddenly closed. When traps are set, they should be left open for a time, and the rats allowed to go in and out without hinderance, till they crowd together in them, and can be taken in great numbers. When rats have been caught in a trap, and have soiled it with their excrements, it should not be washed, nor much handled: it should be left in the same spot as long as any rats are caught. Any change of position excites their caution.

RATANY, RHATANY, or RATANHI'A, is the *Krameria triandra* of botanists. It is a half-shrubby plant found on the dry gravelly soil of Peru. The root is excessively astringent, and is exported to Europe on that account. It is used medicinally in this country as an astringent medicine in passive bloody or mucous discharges, weakness of the digestive organs, and even in putrid fevers. Its powder, mixed with charcoal, forms excellent tooth-powder.

RATE, an assessment levied upon property. Rates are of various kinds, and are denominated with reference to the objects to which they are applied.

The nature of Church-rates is explained under Church-Rates: and rates for the relief of the poor under Poor-Laws. The subject of County-rates is explained under County-Rate. There are also rates levied for the construction and repair of Sewers, and for other purposes.

RATHENAU. [Brandenburg.]

RATHFRILAND. [Down.]

RATHMINES. [Dublin.]

RATIO. This term is best explained by the

synonym *Relative Magnitude*. Thus, in saying that the ratio of 2 to 4 is the same as that of 3 to 6, we say that 2 is relatively to 4 what 3 is relatively to 6. The ratio of one number to another is expressed by the fraction which the first is of the second. Thus the ratio of 4 to 7 is expressed by the fraction $\frac{4}{7}$: 4 is $\frac{4}{7}$ of 7; that of 8 to 12 is most simply expressed by the fraction $\frac{2}{3}$.

We must refer to the *Penny Cyclopædia* for the statement and elucidation of the original meaning and peculiar difficulties of this word.

RATIONAL. A quantity, algebraic or arithmetical, is rational when it can be expressed without the use of the signs of evolution, such as those of the square root, cube root, &c. [IRRATIONAL.]

RATIONALISM is a system of theology which began to be developed in Germany during the latter half of the last century. During this period German theology was little more than a series of controversial writings. At the same time the English school of deists, and Voltaire, and other writers in France, abandoned Christianity, and endeavoured by their writings to undermine its foundations. Reimarus of Hamburg was the first German who adopted similar views, and endeavoured to show the improbability and impossibility of revealed religion, and more especially to prove that the books of the Old and New Testaments were not of divine origin, and that the doctrines of Jesus were of a political nature. His scheme, it was alleged, was thwarted by his execution, and his disciples, discouraged by this blow, are represented as having propagated a report of the resurrection of their master, and as having disguised their real object by cunningly introducing some modifications into their system. The publication of these opinions created an extraordinary sensation among German divines. The majority remained faithful to their belief; but another class, though opposed to the views of the deists, struck out a middle path. These were the Rationalists, who denied the divine origin of the Scriptures, but they dissented from the deists, who affirmed that the Bible was the product of fraud, and they maintained that, notwithstanding all the apparent incongruities of the Bible, it was based on historical foundations, to ascertain which was the problem of reason. The authors of the biblical books, according to the Rationalists, were not impostors, but men of moral purity, who being deluded by their imagination, considered things to be miraculous which were natural occurrences. Other portions of the Bible, they said, which have hitherto been considered as recording supernatural events, need only to be divested of the figurative mode of expression peculiar to all Eastern nations, in order to appear as the records of ordinary occurrences. This mode of interpretation was the more readily adopted by many theologians, as it had been and was then still applied to the stories of heathen antiquity. Attempts had been made to elicit real history from mythical traditions, by stripping them of their poetical embellishments. But what remained after such a process was generally imperfect, and could only be completed by supplying additional circumstances, which were thought necessary to make up a connected history, and which the writer was supposed to have overlooked or neglected, though the narrative did not contain anything to justify such a supposition, and in many cases was directly opposed to it. The history thus constructed out of the interpreter's imagination was offered as truth, and this mode of interpretation, though in reality the most irrational, was called the rational method of interpreting the Scriptures. To account for the supposed collateral circumstances and the minute details in the accounts of so many miracles, by imagining that they arose merely out of the psychological state of the beholder or reporter, would suggest to the mind of the reader of these rationalistic interpretations a greater miracle than that which they endeavour to explain away. This method moreover leaves such a wide field of speculation, that twenty expounders, each translating the supposed allegorical expressions into his own language, might produce twenty different stories, all of which might with equal plausibility be elicited from the original report, and each might claim to be the true historical foundation. According to this theory, there is no end of probabilities and possibilities.

The theologians who first came forward as advocates of this new system were Semler, J. D. Michaelis, and J. G. Eichhorn. They directed their attacks against the deists as well as against the orthodox divines, but they confined the application of the rationalistic principle chiefly to the books of the Old Testament. But the chief writer of this school was Eichhorn, who may be considered as its representative, till Paulus occupied a prominent place in it.

The rationalistic system of interpretation was, as we have observed, principally applied to the Old Testament, but the New Testament also contains passages which were too tempting to be passed over by them. It was at first chiefly the appearance of angels in the New Testament on which Eichhorn tried the rationalistic interpretation, and all passages of this kind ought, according to this critic, to be considered as figurative expressions or allegories: thus a happy chance is represented as a saving angel; an internal joy, as the salutation of an angel.

The way being thus prepared, the number of rationalistic divines increased, and their influence became apparent in many other departments of knowledge. A Utilitarian school had at the same time acquired considerable power; and so far as it endeavoured to instruct the people in the so-called useful sciences, and to do away with everything which was deemed superstitious, it supported Rationalism, which now began to be carried out in its whole extent with regard to the New as well as the Old Testament.

None of the rationalistic writers have equalled Dr. Paulus of Heidelberg, in learning or ingenuity; and it is he who has most completely developed the whole system of Rationalism. Paulus first insists upon the necessity of distinguishing between those passages of the Bible in which the writers simply state facts and those in which they give their own opinions of them. A fact,

according to him, is that which the writers describe as having taken place within their own experience; an opinion is the manner in which they interpret an occurrence, and trace it to what they conceive to be its cause. But as these two elements are in most cases mixed up with each other in the biblical writings, Paulus conceives it to be the chief object of the biblical critic to separate them, and to discover the genuine historic truth in the various disguises with which the opinions of the age and of the writer have surrounded it, and he thinks, with Eichhorn, that this object may be accomplished if the critic transports himself as much as possible to the scene of the events, and supplies such accessory and explanatory circumstances as may have been neglected or overlooked by the reporter or eye-witness. Thus the New as well as the Old Testament is deprived of its divine character. Christ is no longer the Son of God, but a wise and virtuous man; his miracles are either acts of friendship and humanity, and manifestations of his skill in the healing art, or the effects of a happy chance. In short, the whole history of the Bible assumes an aspect totally different from that of the original records, and from that which their authors manifestly intended; it becomes a romance without any foundation except the assertion of the Rationalist that things did actually happen in this or that manner.

A reaction manifested itself during the first ten years of the present century. The consequences of the French Revolution created a general desire to return to the religious and political institutions of past times. But this reaction had very little effect in theology, as it manifested itself rather in passive and retired mysticism than in energetic efforts against the Rationalists. A vigorous opposition however began in 1810, by the publication of Reinhard's 'Geständnisse,' in which Rationalism and Supernaturalism were declared to be utterly irreconcilable with each other. This assertion was denied by other theologians, who endeavoured to reconcile the two schools. The contest which then commenced was carried on in a calm and philosophic spirit till 1817, when the centenary anniversary of the Reformation was celebrated in Germany, and the supernaturalistic party, headed by Dr. Harms of Kiel, endeavoured to make the question a practical one, and to draw to it the attention of the governments and of the whole German nation. The Rationalists were now universally decried as infidels; and innumerable works were written by the theologians of both parties to defend their opinions. The principal champions on the supernaturalistic side, besides Harms, were Hengstenberg and Tholuck; on the side of the Rationalists were Gesenius, Wegscheider, and Paulus. In these controversies the rationalistic theory itself almost disappeared, and the question assumed the more general character, whether the Protestant church should allow freedom of thought or not. This turn of the question induced many of the moderate Supernaturalists, who could not sacrifice their liberty of conscience, to side with the Rationalists. Their wish however was merely to bring about some

kind of a reconciliation, and not to allow the question to become a national one. Their opinion was that it should be kept strictly within scientific limits, and confined to the learned. Although willing to make concessions to the Rationalists on many points, they were yet anxious to prevent any practical innovations.

After this fierce contest, which led to no decisive results, a complete indifference prevailed, and all hopes of producing any definite result seemed to be given up. Each party however continued to maintain its tenets.

Notwithstanding the wide breach between the two parties, approximations were made on both sides, so that the Supernaturalists as well as the Rationalists might each be divided into two parties. Some of the latter, such as Paulus, Wegscheider, Gesenius, Schulthess, Schulz, and others, continued to consider reason as their only guide in matters of religion, and rejected every supernatural revelation: others, the so-called Supernaturalistic Rationalists, admitted indeed a supernatural revelation, but considered reason as the only means of recognising and acknowledging it: they thus still allowed reason to be the supreme judge in matters of religion. To this class of Rationalists belong Bretschneider, Von Ammon, Böhme, Hase, Köster, and others. A similar division exists among the Supernaturalists.

The view which the Rationalists had taken of the Scriptures contained some elements which have of late led to a new crisis in German theology. Some parts of the Scriptures, from which the Rationalists saw no hope of eliciting a genuine history, they had declared to be a mere legend or mythus. The profound investigations into ancient profane history had led to similar results in other departments, and the hollowness of the Rationalist interpretation was either loudly proclaimed or tacitly acknowledged by all parties. The consequence was either a return to the supernaturalistic view, or further progress in the path of the Rationalists. Those Rationalists who could not do the former now applied the principle to which they had formerly recourse only in cases of extreme difficulty, to the whole body of the early and miraculous portions of the Scriptures, which they placed on the same footing with the fabulous stories of ancient Greece and Rome. According to this view, all the events in the Bible are either natural events, such as occur in the history of other nations, and which must be examined according to the general principles of historical criticism, or they are of a miraculous and supernatural character, and must for this reason be rejected as not historical, like the fabulous accounts of ancient mythology. As the rationalistic school directed its first attacks against the deists, so the mythical school, though diametrically opposed to the Supernaturalists, has hitherto directed its main efforts against Rationalism. We must nevertheless consider this last school as a second form of Rationalism, in as far as, like Rationalism in its first form, it takes reason for its sole guide, and denies all supernatural revelation. The only difference is that it denies the Biblical records to be the works of eye-witnesses

and contemporaries, and hence draws the conclusion that it is utterly impossible to elicit from those portions which are supposed to consist of mythical stories anything like a true history.

Up to the year 1835, this second form of Rationalism had been applied only partially, and chiefly to portions of the Old Testament; but it has lately been carried out in its full extent with reference to the books of the New Testament, by Dr. David Friederich Strauss, in his Life of Jesus, 'Das Leben Jesu kritisch bearbeitet,' in 2 vols. This work, the production of a man of great learning, profound reflection, and critical skill, has called forth a host of polemical works, but the best efforts against it have been made by the Supernaturalistic school. Rationalism in its first form seems to have received its death blow from this work and the various controversial writings of Strauss and others. The contest between this school and the Supernaturalists is still going on. Both parties have been honest enough to give way whenever any of their disputed points have been proved to be untenable. This is manifest from the 'Life of Christ,' published a few years ago by Neander, and from the different editions of the work of Strauss.

RATISBON (*Regensburg*), the capital of the circle of the Regen, in Bavaria, is one of the most ancient towns in Germany, having been built by the Romans, by whom it was called Reginum, Castra Regia, and subsequently Augusta Tiberii. In the second century it was already a place of trade. Before the time of Charlemagne, and long subsequently, it was the chief town in Bavaria, and governed by counts of its own under the immediate protection of the German kings. From 1663 to the dissolution of the German Empire in 1806, it was the seat of the Imperial Diet.

Ratisbon is situated in 49° N. lat., 12° 22′ E. long., in an extensive and fertile valley, on the right bank of the Danube, opposite to its confluence with the Regen. The Danube here forms two small islands, called Oberwörth and Niederwörth, which are connected with each other and with the banks of the Danube by a remarkable stone bridge, 1100 feet in length and 23 feet wide, which was built in the years 1135-1140, and connects Ratisbon with its suburb Stadt-am-Hof on the left bank. The town is surrounded with ramparts, but the ditches have been filled up. Most of the houses are built of stone; they are very old-fashioned, and their great height adds to the gloominess of the streets, which are narrow and crooked, but clean and well-paved. The most remarkable buildings are the ancient rath-house, in which the German Diet held its sittings; the Gothic cathedral, one of the finest in Germany, within the large precincts of which are two older cathedrals, one now called the Baptistery and dating from the 10th century; the other in the form of a basilica, and dating from Roman times; the Scotch Benedictine church of St. James; the vast abbey of St.-Emmeran, which now forms the palace of the Prince of Thurn and Taxis; and the churches of the ancient abbeys of Niedermünster, and Obermünster. There are in all one cathedral and 27 other churches and chapels. Besides the library in the town-house, there are some other considerable libraries and collections of works of art; also a botanical garden, a Catholic and Lutheran gymnasium, an ecclesiastical seminary, a school for the blind, and a school of design. There are extensive bleach-grounds and breweries; and manufactories of leather, tobacco, wax-candles, soap, cutlery, earthenware, porcelain, fire-arms, and carriages. The inhabitants carry on a considerable trade in salt, timber, corn, and their own manufactures, and transact extensive business on commission. The population is 21,904, of whom two-thirds are Catholics, and most of the rest Lutherans. Steamers ply daily to Linz and Vienna.

Near the city is a monument, erected in 1817, in honour of Kepler, who was born here; and on a rock above the Danube, six miles below Ratisbon, stands the *Walhalla*, a marble temple of the Doric order, erected on the plan of the Parthenon of Athens, by the ex-King Ludwig of Bavaria, in honour of the great men of Germany.

RATTAN CANES. [CALAMUS.]

RATTLE. [RHINANTHUS.]

RATTLESNAKE. [VIPERIDÆ.]

RATZEBURG. [MECKLENBURG.]

RAVAILLAC. [HENRY IV.]

RAVEE. [HINDUSTAN, vii. 212.]

RAVELIN, a work constructed beyond the main ditch of a fortress, and in front of the curtain between two bastions. It usually consists of two lines of rampart, which meet in a salient angle on a line drawn perpendicular to and bisecting the curtain; and its form on the ground plan may be seen at Q, BASTION, and at QQ, FORTIFICATION.

The ravelin was probably first constructed in the place of the more ancient barbacan by the Italian engineers of the 16th century. Its original name, *rivellino*, indicates a derivation from *vegliare*, 'to watch;' and both by Maggi (1584) and Errard (1594), rivellino, or ravelin and bastion, are used as the names of a work beyond the walls of a fortified place. A semicircular form was very frequently adopted for a work so situated, and this circumstance may have given rise to the name of demi-lune, or half-moon, by which, even now, the ravelin is often designated. Vauban, in what is called his first system, made the faces of the ravelins about 110 yards long, and directed them towards points on the faces of the bastions at 10 yards from the shoulders [Q, BASTION]. The magnitude of the work was then such as to render it capable of making a good defence: it covered the curtain and flanks of the enceinte, so that the enemy could not demolish their parapets by means of artillery in his distant batteries; and one being placed on each front of the fortress, every two afforded not only a crossing fire on the approaches of the enemy towards the intermediate bastion, but they seriously impeded the formation of the counter-batteries on the crest of the glacis.

Cormontaingne (1736) improved the ravelin by giving it the figure represented at QQ, FORTIFICATION, making the length of each face about 130 yards, and directing it to a point between 20 and

30 yards from the shoulders of the bastions. He also formed in it a strong Reduit, or interior work Y, in order to increase its defensive powers. In the works executed by order of Napoleon about Alessandria (1807), the ravelin is formed beyond the glacis of the fortification to which it belongs, its ditches terminating at the foot of that glacis. This construction secures the fortification from being breached by artillery placed anywhere on the glacis of the ravelin; but it may be objected that a ravelin so detached is liable to be attacked at its gorge. The relief of a ravelin, or its elevation above the level of the ground should be two or three feet less than that of the enceinte, in order that the defenders of the curtain may be able to direct a plunging fire into the work when it is occupied by the enemy.

RAVEN. [CORVIDÆ.]

RAVENGLASS. [CUMBERLAND.]

RAVENNA, a Legation or province of the Papal State, is bounded N. by the province of Ferrara, W. by that of Bologna and by Tuscany, S. by the province of Forli, and E. by the Adriatic. The area is about 700 square miles, and the population in 1843 was 168,413. The eastern part of the province, which lies near the Adriatic, is low and marshy, but the western or inland part, which stretches to the foot of the Tuscan Apennines, in the neighbourhood of Imola and Faenza, is healthy, well cultivated, and thickly inhabited. The chief products are corn, wine, silk, hemp, cattle, and sea-salt. The principal towns of the province are RAVENNA; FAENZA; *Imola*, an episcopal town on the Santerno, which is crossed by a handsome bridge; the town has a fine cathedral and several other churches, a college, an hospital, a manufactory of cream of tartar, and about 10,000 inhabitants. *Cervia*, a small town, in an unhealthy situation, near the sea-coast, has about 1000 inhabitants; *Brisighella*, near the borders of Tuscany, has about 7000 inhabitants, including its territory; and *Castel-Bolognese*, a bustling town, in a fertile district, has about 4000 inhabitants.

The province of Ravenna is crossed by numerous streams, tributaries of the Adriatic. The principal are—the Santerno, which flows by Imola; the Lamone, which flows near Faenza; the Montone, which enters the sea below Ravenna; and the Ronco, which joins the Montone above its mouth.

RAVENNA, an ancient city, once a seaport, but now 5 miles from the Adriatic, is situated 18 miles N.E. from Forli and 30 N.W. from Rimini, in a marshy plain covered with ruins. Between the town and the sea is a forest of pines, which extends about 15 miles along the sea-coast.

The see of Ravenna was founded by St.-Apollinaris, a disciple of St. Peter, in A.D. 44; it was raised to the dignity of an archbishopric in 439. The city is the residence of the legate of the province: it has a college, and civil, criminal, and commercial courts. The population is about 18,000. The cathedral, built in the fourth century, but since that time almost completely rebuilt, retains several sculptures and other remains of its early age: the baptistery, detached from the church, is still in its original state. The churches of San-Vitale, San-Giovanni-Batista, and San-Giovanni-Evangelista are very ancient structures, and contain many interesting antiquities, paintings, and mosaics relating to the Emperor Justinian and the Greek Exarchs. The mausoleum of Theodoric, outside of the town, has a monolithic dome, nearly 100 feet in circumference, which has been transformed into a church, called Santa-Maria-Rotonda. There is a portico, supported by eight granite columns, and other remains of the splendid palace of Theodoric, which was inhabited after his time by the Exarchs. The church of St.-Apollinaris-in-Classe, so called because it was built on the site of the old port, is a magnificent structure, raised also by Theodoric, with twenty-four large columns, each of a single piece of marble, which were brought from Constantinople; and a fine mosaic, representing a view of Ravenna in the sixth century, with numerous figures of saints. The great altar is made of porphyry, verde antico, and oriental alabaster; and the pulpit, which is of marble, is of curious workmanship. Ravenna, next to Rome, is the city of Italy which abounds most with valuable and rare marbles from Greece, Asia, and Africa. The church of St.-Apollinaris contains the tombs of many of the old archbishops of Ravenna, and a series of their portraits. Ravenna has a great number of other remarkable churches, all adorned with rich marbles, valuable paintings, mosaics, and sculptures. In the church of San-Francisco are the tombs of the Polenta family. Among the other remarkable structures are the archbishop's palace, in which is a chapel unaltered since the fifth century, several other palaces, the museum, hospital, and theatre. The 5 gates of the town, and the public squares, most of which are adorned with several columns surmounted by statues, are also worth notice.

The public library of Ravenna contains 40,000 volumes and 700 MSS. There is also a cabinet of ancient medals and inscriptions, and a gallery of paintings. In honour of Dante, who died at Ravenna, and whose remains lay in the church of San-Francesco till 1482, a mausoleum was erected in the year just mentioned by the father of Cardinal Bembo. It is a small square building, containing a sarcophagus of Greek marble, in which the poet's ashes rest. The building was repaired in 1692, and again in 1780.

Ravenna is said to have been originally a town of the Umbri. It was afterwards possessed by the Boii, and formed part of Cisalpine Gaul. In the time of the Empire, Classis, the port of Ravenna, became one of the two great stations for the Roman fleet, Misenum being the other. After the separation of the Eastern and Western Empires, Ravenna attained its greatest importance; and several emperors of the West made it their place of residence. After the fall of the empire, Theodoric the Goth made Ravenna the capital of his kingdom. When Narses, having overthrown the Goths, A.D. 553, was appointed, by Justinian, Exarch of Italy, he fixed his residence at Ravenna, which continued to be the centre of the Imperial administration in Italy till the Longo-

bards took it in 752. In subsequent times the archbishops of Ravenna appear to have had the civil administration of the town and its territory. In the middle ages, Ravenna was a republic, and had its factions, which were headed by two powerful families, the Traversari and the Polenta. In the latter part of the 13th century the Polenta drove away the Traversari, and usurped the supreme power, which they held till 1440, when the Venetians took the town. By these it was kept till 1509, when it was taken by the French. In 1512 the French army under Gaston de Foix fought a desperate battle near Ravenna against the Spanish and Papal troops. The French won the battle, but lost their commander, and soon after they were compelled to retire from Italy. By the treaty of Bologna in 1530, Ravenna and its territory were given up to the pope.

RAVENSCROFT, THOMAS, was born in 1592, educated in St. Paul's choir, and admitted to the degree of Bachelor of Music, by the university of Cambridge, it is supposed, when only 15 years of age. In 1611 he printed his 'Melismata, Musical Phansies,' &c., in which is his justly admired four-voiced song, 'Canst thou love and lie alone?' In 1614 appeared his 'Brief Discourse,' &c., another collection of twenty part-songs, to which is prefixed a discourse or essay on the old musical proportions. In 1621 he published 'The whole Book of Psalms,' &c. The work contains a melody for each of the hundred and fifty psalms, many newly composed, and all harmonised by various persons. He is also supposed to have been the compiler of two other works 'Pammelia' and 'Deuteromelia.' A selection from the four above-named secular works was privately printed in 1822, for the use of The Roxburghe Club, by the Duke of Marlborough, who ascribes the whole to Ravenscroft, though it might have been seen at a glance that this composer was author of but a few, while he may have been editor of all.

RAWITSCH. [Posen.]

RAY, JOHN, or WRAY (as he at one time wrote his name), who may be considered as the founder of true principles of classification in the vegetable and animal kingdoms, was the son of a blacksmith, and was born at Black-Notley, near Braintree in Essex, Nov. 29, 1627. He received a good education, having been sent first to the grammar-school at Braintree, and afterwards to the university of Cambridge, where he entered at Catherine Hall, but subsequently removed to Trinity College, of which he was elected a fellow in 1649, together with Isaac Barrow. At the age of twenty-three he was appointed Greek lecturer, and two years afterwards mathematical tutor to his college. He was also private tutor to several gentlemen of rank, and among others to one who possessed a kindred spirit to himself, and whose name afterwards became closely associated with his own in the paths of science, Francis Willughby. Ray was always fond of the study of natural history, but it is recorded by his biographers that the circumstance which chiefly gave rise to his cultivation of the science of botany (in which he afterwards became so distinguished), was an illness, for the removal of which he was recommended to take frequent exercise out of doors. Being compelled to remit his drier studies, he collected and investigated the different wild plants which he met with in his walks about Cambridge, and in 1660 published a 'Catalogus Plantarum circa Cantabrigiam nascentium,' 1 vol. 8vo, which he says took him ten years to compile.

During his residence at the University he travelled over the greater part of England, Wales, and Scotland, in the pursuit of botanical and zoological information, and was generally accompanied in these excursions by his friend and pupil Mr. Willughby. At the Restoration he took orders, but never held any church preferment, nor performed regular parochial duty; and two years afterwards he was obliged to resign his followship in consequence of the passing of the Act of Uniformity, to which he could not conscientiously subscribe. After leaving the university he resided chiefly with Mr. Willughby at Middleton Hall in Warwickshire, and devoted the remainder of his life solely to the pursuits of natural history. In 1663 he embarked for the Continent with Mr. Willughby, where they remained for three years travelling through the Low Countries, Germany, Italy, Switzerland, and France; and collecting information respecting the animals and plants which inhabit these different countries. Willughby attended chiefly to zoology, and Ray to botany. An account of this tour was published by Ray in 1673, 1 vol. 8vo. In 1667 he was elected a fellow of the Royal Society, to the Transactions of which learned body he contributed some valuable papers. In 1672 he had the misfortune to lose his friend Mr. Willughby, who died at the age of 37, leaving him guardian to his two sons (the younger of whom was afterwards created Lord Middleton) and a legacy of 60*l.* per annum. After superintending the education of Mr. Willughby's children for some time at Middleton Hall, he removed to Sutton Coldfield, in Warwickshire, and then to Falkbourn Hall, Essex, and lastly he settled in 1679 at Black-Notley, his native place, where he remained till his death, which took place January 17, 1704-5, at the age of 77. In 1673 he married a young lady 24 years younger than himself, by whom he left three daughters. Ray was not more respected for his scientific acquirements than for his benevolence, which was combined with high moral and religious worth.

Ray left many works, among which we may name the following. His first publication was the 'Catalogue of Plants growing in the Neighbourhood of Cambridge.' This work contains a description of 626 species arranged alphabetically, and accompanied with the synonyms of the principal botanical authors who had preceded him: it is curious, from its being the first production of a man who afterwards attained to such great celebrity, and it exhibits traces of those singular powers of observation which he afterwards so eminently displayed. A supplement to this catalogue appeared in 1663, and a second in 1685.

In 1682 appeared his 'Methodus Plantarum Nova,' 1 vol. 8vo., in which he proposed a new method of classifying plants, which, when

altered and amended, as it subsequently was by himself at a later period, unquestionably formed the basis of that method which under the name of the system of Jussieu is universally received at the present day.

His arrangement was too far in advance of the knowledge of the day, and the consequence was that it was little appreciated or adopted by his contemporaries and immediate successors, who, instead of improving the arrangement so ably sketched out, set about establishing others on artificial principles, all of which are rapidly sinking into oblivion, while the principles of Ray are tacitly admitted, and many of his fundamental divisions adopted in that beautiful but still imperfect natural system which has been formed by the labours of Jussieu, Brown, De Candolle, Lindley, and others.

While making important improvements in classification, he did not neglect the study of species; his 'Catalogus Plantarum Angliæ' first appeared in 1670, arranged alphabetically, and has been the basis of all subsequent Floras of this country. A second edition appeared in 1677, and in 1690 he published a third, entitled 'Synopsis Methodica Stirpium Britannicarum,' which is arranged according to his natural system. Another edition of the 'Synopsis' came out in 1696, and it was again republished by Dillenius in 1724. This work, of which the edition of 1696 is the best, is very accurate. Ray examined every plant described in the work himself, and investigated their synonyms with great care.

In 1694 he published 'Stirpium Europæarum extra Britannias crescentium Sylloge.' This work contains a description of all those plants which he had himself collected on the continent, as well as many which had been described by others. The synonyms are here very exact.

His largest botanical work was a general 'Historia Plantarum,' the first volume of which came out in 1686, fol.; a second appeared in 1688; and a third, which was supplementary, in 1704. In this vast work he collected and arranged all the species of plants which had then been described by botanists; he enumerated 18,625 species. Haller, Sprengel, Adanson, and others, speak of this work as being the produce of immense labour, and as containing much learning and acute criticism; but from its nature it was of course principally a compilation.

Ray made many researches in vegetable physiology. He published a very interesting paper in the 'Philosophical Transactions' (No. 68), on the mode of ascent of the sap, and we find many observations on the structure and functions of plants scattered through his various works.

In zoology Ray ranks almost as high as in botany; and his works on this subject are even more important, as they still in a great measure preserve their utility.

The 'Ornithologia' of Willughby, which was the first part of the work that appeared, was published in 1676, 1 vol. fol., with seventy-seven plates. An English translation of it, by Ray, appeared the following year. The remaining part, which is the most complete, was the 'Historia Piscium,' and did not come out till 1686, 2 vols. fol. These works contain a great number of new species of birds and fishes, which had been discovered by Willughby and Ray in Germany and Italy, as well as those which had been previously described. Cuvier says, 'the fishes of the Mediterranean are described with rare precision, and it is frequently easier to find species in Willughby than in Linnæus.' Many of the figures in these works are original, and very good.

Ray published several works of his own on zoology. He undertook to form a classical arrangement of the whole animal kingdom, as he had of the vegetable; and, in 1693, he published his 'Synopsis Methodica Animalium, Quadrupedum, et Serpentini Generis,' 1 vol. 8vo. Similar volumes on birds and fishes were also prepared by him, but were not published till after his death, by Dr. Derham, in 1713. The last two are principally abridgments of the great works published under the name of Willughby. He also left a history of insects, which was likewise published by Dr. Derham, at the expense of the Royal Society, and contains an appendix on beetles, by Dr. Lister.

In addition to his numerous scientific writings, Ray composed several works on divinity and other subjects: the best known of these are—'A Collection of Proverbs,' which came out in 1672, and went through several editions; 'The Wisdom of God in the Creation,' 1690, which also had an extensive sale; 'A Persuasion to a Holy Life,' 1700; and three 'Physico-Theological Discourses concerning Chaos, the Deluge, and the Dissolution of the World,' 1692.

RAYED or RADIATED ANIMALS, *Radiaria* or *Radiata*, Lamarck's name for a class of invertebrate animals, which he divides into the *Radiares Molasses* and the *Radiares Echinodermes*. Of the former, the *Medusæ* are an example [PULMOGRADA]; the latter consist of the ECHINODERMATA. [STELLIRIDIANS.]

RAYNAL, GUILLAUME THOMAS FRANÇOIS, was born in 1711, at St. Geniez, in the department of Aveyron. He studied in the Jesuits' College at Pézénas, and took orders as a priest. He afterwards left the Jesuits, and went to Paris, where he was made assistant curate of the parish of St. Sulpice, in 1747. He next became editor of the 'Mercure de France.' He wrote an 'Histoire du Stathouderat,' 12mo, 1748, and an 'Histoire du Parlement d'Angleterre', both superficial works, and the latter also inaccurate. From these and his 'Anecdotes Littéraires,' 'Anecdotes historiques, militaires, et politiques,' and other similar light works, he derived a considerable profit. At the same time Raynal speculated in mercantile affairs, and, it is said by Désessart in his 'Siècles Littéraires de la France,' that he employed capital in the slave-trade.

In 1770 he published his great work, by which he is chiefly known, 'Histoire Philosophique des Etablissemens des Européens dans les deux Indes,' 4 vols. 8vo. Although many passages were written in a very violent tone against monarchy, and especially the French monarchy, and against Christianity, the French government authorities

took no notice of the book until May, 1781, when the parliament of Paris condemned it to be burned by the hand of the executioner, and ordered the author to be arrested and his property sequestrated. Raynal escaped to Spa, where he continued his attacks upon the church, having long previously openly renounced his priestly character, and spoke of himself as 'having been once a priest.' From Spa he repaired to Saxe-Gotha, and thence to Berlin, where he obtained an audience of Frederic the Great, who, being displeased at some passages of his work which reflected upon himself, affected ignorance of the subject, and would not converse upon it. In 1787 Raynal was allowed to return to France, but not to Paris. His friend Malouet, who was intendant-general of the navy at Toulon, received him hospitably in his house.

When the first symptoms of the French Revolution showed themselves, Raynal was elected by the city of Marseille as their representative in the states-general. He declined the honour on the plea of old age; but the fact was that his opinions had undergone a great change. In May 31, 1791, Raynal addressed an eloquent letter to Bureau de Puzy, president of the National Assembly, in which he expressed his regret that 'he was one of those who, by expressing in his works a generous indignation against arbitrary power, had perhaps been the means of putting weapons into the hands of licentiousness and anarchy.' This letter, being read publicly by the president, occasioned a violent storm in the Assembly. Journals and pamphlets vied with each other in abusing Raynal as a renegade and a dotard. Raynal however remained quiet in the neighbourhood of Paris; he passed unmolested through the period of terror; and he died in March, 1796, at the house of a friend at Chaillot. Just before his death the Directory had named him member of the National Institute, and his 'éloge' was read by Lebreton at one of the first sittings of that body. Raynal's great work is a fair sample of that dangerous species of composition which was known in the last century by the name of 'philosophical history.' It has been the subject of many strictures, refutations, and corrections.

RAZOR-BILL. [Auk.]

RAZZI, GIOVANNI ANTONIO, called *Il Sodoma*, was born about 1479, most probably at Vergelli, a village near Siena. He was instructed in painting, according to Vasari, by Giacomo dalle Fronte, but he chiefly formed his principles by an attentive study of the works of Lionardo da Vinci. Among his earliest performances were the pictures he painted in 1502, at Monte Oliveto, representing the history of San Benedetto. In the Chigi Palace, now called the Farnesina, at Rome, are some of his pictures, representing the history of Alexander the Great, the most noted of which is the Marriage of Roxana. At Siena he painted many works. The Adoration of the Magi, in the church of San Agostino, resembles the style of Lionardo da Vinci, and some amateurs prefer the Scourging of Christ, in the convent of San Francisco, to the same subject by Michael Angelo; nor is the Swoon of St. Catherine of Siena, painted in fresco, in one of the chapels of San Domenico, unworthy of the pencil of Raphael. The St. Sebastian, in the gallery at Florence, is supposed to be painted from an antique torso. He seems to have had many pupils, the principal one of whom was Bartolommeo Neroni, generally called Maestro Riccio. Razzi died in 1554, and is placed by Lanzi in the second epoch of the Sienese School.

RÉ, ISLE OF. [Charente Infe'rieure.]

READER. [Barrister.]

READING, the county town of Berkshire, a municipal borough, and parliamentary borough, is situated on the river Kennet, just above its junction with the Thames, 36 miles from the Paddington station, London, by the Great Western Railway, or 42 miles from the General Post Office by Brentford, Hounslow, and Maidenhead. The Lent Assizes are held at Reading; the Summer Assizes at Abingdon.

The town lies partly between the Kennet and the Thames, and partly on the south side of the Kennet. It is very irregularly laid out; but is well paved, and lighted with gas, and amply supplied with water from the Kennet. The houses are in general substantial, and built of brick; but there are some old houses of lath and plaster, with high gables. St. Lawrence's church appears to have been considerably repaired in 1434, but there are some portions of the original structure of Norman character. There is a fine tower at the west end, of perpendicular architecture and of checquered flint-work. St. Mary's Church was rebuilt about 1551, chiefly from the materials of the abbey church, then pulled down; it has a tower of similar character to that of St. Lawrence, but not equal to it. St. Giles's is the other parish church. The town-hall is a modern building, over a part of the free-school. The county-gaol is a handsome building constructed at a great expense within the last few years, for the application of the Separate System, which has been here carried out. There is a large union workhouse; and the town contains also a public library and news-room, called the Reading Institution, a subscription news-room, a small theatre, and baths. There are several almshouses, and a dispensary. As the river Kennet has a divided channel, there are many bridges; that over the main stream, in Duke Street, is a handsome stone bridge of one arch, with balustrades. There are some ruins of the abbey, especially one of the gates, and also some interesting remains of the abbey mill.

The trade of the town is considerable. There was anciently a large manufacture of woollen cloth, but it has become extinct. Some silk ribands and galloons are woven, and some floor-cloth and sail-cloth are made. There are iron foundries, breweries, and yards for boat-building. Trade is carried on in corn, seeds, malt, timber, bark, hoops, wool, cheese, and beer. The Kennet is navigable to the Thames, and the Kennet and Avon canal affords a water communication with the west of England.

The municipal borough is divided into 3 wards, and is governed by 6 aldermen and 18 councillors: population, in 1841, 18,937. The parliamentary borough returns 2 members: population, 18,499.

READING. [Pennsylvania.]

REAL ESTATE. [Estate; Property.]

REALEJO, a seaport on the Pacific, in the republic of Nicaragua, department of Leon, in 12° 30′ N. lat., 87° 7′ W. long. The harbour, formed by a small bay, at the entrance of which are two islands, is spacious and safe, and has good anchoring-ground. The town is built on the northern shore of an inlet near the bay: it contains a population of about 3000, but if that of the neighbouring village of Chinandego is included, it hardly falls short of 15,000. The inhabitants are chiefly merchants and persons occupied in ship-building, for which the neighbouring forests supply abundance of timber. Ship-building is a large branch of industry, and there are docks for that purpose. The commerce with the other republics of South America is considerable. The principal articles of trade are cacao, indigo, sugar, timber, mahogany, cedar-wood, tar and pitch, sail-cloth, and hides. Realejo may be considered as the port of the town of Leon, which is only about twelve miles distant, and connected with it by a carriage-road, the whole intervening distance being nearly on a level. The activity along the western coasts of America, consequent upon the discovery of gold in California, and the position of the town at the western terminus of the projected ship-canal between the Atlantic and the Pacific Oceans, are likely to render Realejo a place of considerable importance.

REALGER. [Arsenic.]

REALISTS. [Nominalists.]

REAPING (or cutting the corn when it is ripe) is one of the most important operations of harvest. It requires many hands to accomplish it in proper time, so that the corn which is ready for the sickle may not be too ripe and shed, nor the fair weather be allowed to pass before all the corn is secured in barns or stacks. The labourers who are required all the year for the common purposes of husbandry seldom suffice for the harvest, especially on extensive farms, and recourse is usually had to the assistance of mechanics and artisans from the neighbouring towns and villages where the population is considerable, or labourers are induced by good wages to come from a distance.

The common Reaping-Hook, or Sickle, with which the corn is usually cut, is one of the oldest instruments of husbandry, and the goddess Ceres was generally represented by the ancients with a sheaf of corn and sickle in her hand. In reaping with the sickle, a portion of the stems is collected with the left hand, and held fast, while the sickle in the right hand is inserted below the left, taking the stems in its semicircular blade, and cutting them through by drawing the sickle so as to act as a saw, for which purpose the edge is finely serrated in a direction from the point to the handle. The heads of the corn, with the upper part of the straw, are then laid on the ground in quantities which may readily be collected into a sheaf. Practice soon gives dexterity to the reaper; and he finds it more expeditious to cut small quantities in succession until he has filled his hand, than to attempt to cut through a large handful at once. Severe wounds are often inflicted on the fingers of the left hand by beginners, even to the loss of a finger. The division of labour is introduced with advantage amongst a band of reapers. A certain number cut the corn, while others follow to gather the sheaves; some only preparing the bands, and others tying them and setting up the sheaves into stooks or shocks, which usually consist of ten or twelve sheaves. The smaller the sheaves are, the less injury the corn sustains in a wet harvest; as the moisture in a thick sheaf does not so readily evaporate. Hence it is the interest of the farmer to see that the reapers do not make the sheaves too large. In many places there is a regular measure for the circumference of a sheaf, which should never exceed thirty inches. The bands are made by taking two small handfuls of the cut corn, and crossing them just below the ears into a knot. The sheaf is then pressed with the knee, and the band drawn tightly around it. The ends are twisted together like a rope, and inserted under the band, which effectually fastens it. This operation is soon learnt, and is done very rapidly. The sheaves should be so tied that there may be no danger of their falling loose when pitched into the cart or stacked, without being so tight as to prevent the moisture in the straw from evaporating. They should not be tied too near the ears, but rather nearer to the butt. The sheaves, when tied, are placed two and two on the butt-ends, with the ears leaning against each other: sometimes they are placed in a circle, all the ears being together, and the butts slanting outwards: a sheaf is then opened, by inserting the hand into the middle of the ears, and reversed over the tops of the preceding, forming a cone, and covering all the other ears, while it hangs down around them. In this position they will bear much rain without injury. It is a good practice to place the shocks across the furrows between the stiches or lands, so as to allow the air to circulate more freely around them.

Wherever the sickle is used for reaping, the straw is cut at a certain height from the ground, and the remainder forms a stubble, which is sometimes mown at leisure after harvest, and carried into the yard for litter; but in the neighbourhood of large towns, where straw is sold at a good price, or exchanged for stable dung, it is important that as much as possible of it should be cut with the corn. This has introduced the practice called Fagging, and sometimes Bagging, the origin of which provincial expressions is not well known. The instrument used for this purpose partakes of the nature of a sycthe, as well as of a reaping-hook. It is shaped like a sickle, but is much larger and broader; and instead of being indented like a saw, it has a sharp edge like a scythe, which is renewed when blunt by means of a stone or bat. The Fagging-Hook cuts the straw close to the ground by a stroke of the hand; and its curved form is only useful in collecting stray stems, and holding a certain quantity of them between it and the left hand of the reaper when he makes up a sheaf. A certain quantity is cut towards the standing corn, the left hand pressing

it down at the same time. When as much is thus cut as would make half a small sheaf, the reaper comes backwards, cutting in a direction at right angles to the first, and rolling together the two parts, which he carries in the bend of his hook and places on the band which had been prepared for him. A full-sized sheaf is usually composed of two cuttings. Two men will fully employ a third to make bands for them, tie up the sheaves, and set them up. This method of reaping is laborious, on account of the stooping required to cut near the ground. The Hainault Scythe, which has been described in most agricultural works, does the work better, and with less fatigue: it is in fact a fagging-hook, but is not quite so much curved, and of which the handle is longer, and placed at an angle with the plane of the blade. A better instrument however on extensive farms is the Cradle-Scythe, which, in the hands of an expert mower, will do more work and more effectually secure all the straw than any other instrument.

REASON, according to the common notion, is the highest faculty of the human mind, which enables a man to contemplate things spiritual as well as material, to weigh all that can be said or thought for and against them, and hence to draw conclusions, and to act accordingly. A man may therefore be said to possess reason in proportion as he exercises that power, that is, reasons and acts according to the conclusions at which he has arrived. In such expressions as 'We have reason to believe such an account,' or, 'He has no reason to be dissatisfied,' the word 'reason' does not signify the mental power itself, but the conclusion or result of the process of reasoning, in contradistinction to motives, which are merely outward circumstances which influence our actions.

Thus far reason is of a purely practical nature, and Kant therefore divided reason (if we may venture to translate his word *Vernunft* by the English word *Reason*) into practical and theoretical. The latter, which is also called pure, ideal, or transcendental reason, is, according to him, the mind's power of producing ideas *à priori* from its own resources, or the power of conceiving things and their attributes which lie beyond the sphere of our experience, such as infinity, the absolute, God. How far our knowledge of these things can extend is shown in the work of Kant, entitled 'Kritik der reinen Vernunft,' or 'Criticism of Pure Reason.' Reason, in its practical acceptation, forms ideas *à posteriori*, in as far as it derives them from a consideration and comparison of the phenomena of the external world, endeavours to discover unity in variety, and traces all phenomena to one source, a supreme reason, of which human reason is only a reflex.

Schelling defines reason to be the identity of the subjective and the objective, that is, the identity of the power which knows and that which it knows, which includes the knowledge of this identity. As the original identity, says he, exists in God, or is God, reason is a direct knowledge or an intellectual perception of God, of whom no indirect knowledge is possible. Hence God and reason are essentially of the same nature; they are identical: God is in reason, and reason is in God.

RÉAUMUR, RENÉ-ANTOINE FERCHAULT DE, was born at Rochelle in 1683. Possessing an independent fortune, he gave up the law, for which he had been educated, and went to Paris in 1703, where he determined to devote his life to scientific pursuits. In 1708 he read some geometrical observations before the Academy of Sciences, which were so well received that he was admitted a member at the age of 24. He belonged to that body for fifty years, and contributed a number of papers to their Memoirs.

The chief objects of his attention were the improvement of the arts and manufactures of his country, and natural history. The most important of Réaumur's labours in the department of the arts were the experiments which he made on the manufacture of iron and steel. He published his researches on this subject in a separate work, entitled 'Traité sur l'Art de convertir le Fer en Acier, et d'adoucir le Fer Fondu.' He here described the process of making steel, which was then unknown in France, and he also discovered the art of tinning iron, which was likewise unknown in France. Among his other labours he greatly improved the manufacture of porcelain in France. In 1711 he discovered a species of mollusk from which a purple dye might be prepared analogous to the purple of the ancients.

In general physics the name of Réaumur is celebrated from the thermometer which he invented in 1731. The centigrade thermometer now in more general use in France was only an improvement on Réaumur's, the interval between the freezing and boiling points being divided into 100 instead of 80 degrees.

Of all the works of Réaumur, the most remarkable are his 'Mémoires pour servir à l'Histoire des Insectes,' of which 6 volumes 4to. appeared between 1734 and 1742. Cuvier says, 'The author here carries to the highest point his acuteness of observation in the discovery of those instincts, so complicated and so constant in each species, which maintain these feeble creatures. He unceasingly excites our curiosity by new and singular details. His style is a little diffuse, but clear, and the facts which he relates may always be depended on.' While collecting materials for this work we find it recorded that he kept numerous insects of all kinds in his garden, for the purpose of observing their habits and instincts. Unfortunately this work is not finished. The six volumes which were completed include all the winged insects, except the crickets, grasshoppers, and beetles.

Réaumur formed a large collection of objects of natural history, of which Brisson was the conservator, and the principal materials for that naturalist's works on quadrupeds and birds were collected from it. Many of Buffon's plates were also taken from objects in Réaumur's museum, which, after his death, went to the 'Cabinet du Roi.' Réaumur passed a quiet retired life, and his private history is unmarked by any important incident. His death took place in October, 1757.

REAUMURIACEÆ, a natural order of plants

belonging to the Exogenous class. The species of this order are small shrubs, with fleshy scale-like leaves, which are alternate and have no stipules, and are overspread by resinous sunk glands. The genus *Reaumuria* was named by Hasselquist in honour of Réaumur. *R. vermiculata* is a native of Egypt, and is used at Alexandria as a remedy for the itch, being bruised and applied externally, and a decoction taken internally. All the plants of this order abound in saline matter in their tissues.

REBATE is the old English word for DISCOUNT. The discounting of a sum of money, or the paying something less for it before it becomes due, is now always done by striking off a certain percentage from the sum. Thus, if a sum be due a year hence, say 100*l.*, discounting at five per cent. means paying 95*l.* now in lieu of 100*l.* a year hence.

REBEC, a musical instrument (now disused) of the violin kind, which had three strings tuned in fifths, played on by a bow. It was somewhat smaller than the violin.

REBOLLE'DO, BERNARDINO, COUNT OF, a distinguished Spanish officer and writer, was born at Leon, in 1597. He gained considerable distinction during several years' service in Italy, and in 1632 he commanded a body of Spanish infantry in the Low Countries. Having, in 1636, received orders to march to the assistance of the Emperor Ferdinand II., who was closely pursued by the Swedes, he succeeded in extricating that monarch from his perilous situation, and was by him rewarded with the title of Count of the Germanic Empire and the government of the Lower Palatinate. At the conclusion of the war Philip IV. appointed him his ambassador to the court of Denmark. He had whilst in Germany composed a sort of didactic poem on the art of war and state policy, entitled 'Selvas Militares y Politicas;' and he seems to have taken particular interest in the history and geography of Denmark, a compendium of which he put into verse, which was printed at Copenhagen, under the title of 'Selvas Danicas,' 1665, 4to. After a residence of several years at the court of Denmark, Rebolledo was recalled to Madrid, where he was appointed president of the Board of War in the council of Castile. He died in 1676. Rebolledo wrote many other works. His lighter poems appeared at Antwerp, 1660, 16mo., under the title of 'Ocios' (Leisure Hours). The best and most complete edition of his works is that of Madrid, 1778, 4 vols. 4to.

REBUTTER. [PLEADING.]

RECEIPT. In its more general and popular sense, Receipt means a written discharge of a debtor on the payment of money due. When given for sums greater than five pounds, it must be stamped. The amount of the stamp duty varies with the sums for which it is given from 3*d.* to 10*s.* In Ireland the lowest stamp is 2*d.*, and the rates are otherwise different from those in Great Britain. A receipt, though evidence of payment, is not absolute proof, for this evidence may be rebutted by showing that it has been given under mistake or obtained by fraud. The only object of requiring a stamped receipt is to obtain revenue. It is one of the many modes of taxation. The revenue from receipt-stamps annually amounts to about 200,000*l.* for the whole of the United Kingdom. (Impey's 'Stamp Act;' 55 Geo. III. c. 184; 3 & 4 Wm. IV. c. 23.)

RECEIVER. A receiver is a person appointed by the Court of Chancery to receive the rents and profits of land, or the produce of other property, which is in dispute in a cause in that court. He is an officer or agent of the court, and as such under its general control.

The cases in which a receiver is appointed are those in which there is great danger of property being wasted or lost, owing to the want of a proper person to look after it. The following are some instances in which a receiver will be appointed: when an infant is entitled to real estate, especially if it be of considerable magnitude; in suits between partners in trade for the purpose of winding up the concern, when a partner is grossly misconducting himself; when the representation to a person deceased is in dispute in the ecclesiastical courts, and no person has been appointed executor; when there is danger of the assets of a testator being lost or wasted through the misconduct of an executor. A receiver must find sufficient sureties. He is paid by a percentage on the sums which he receives; and sometimes, in the case of large estates, by a salary. The court may however refuse to allow payment, and sometimes one of the parties to the cause, with the consent of the others, acts as receiver without pay. A receiver must annually pass his accounts before a master in chancery.

RECESS. This word is so familiar as to need no explanation, and it can hardly be classed among architectural terms. By recesses we here mean those which come under the denomination of exhedræ, tribunes, alcoves, and afford considerable additional space. In plan these may be either curved or rectilinear, that is, semicircular (like the tribune of a Roman basilica) or segmental; or else polygonal, or rectangular, in which latter case the plan may be either a parallelogram, or so deep as to be a perfect square. If the plan be curved, it is usual to make the elevation in the form of an arch, either plain or decorated; in which latter case, it is sometimes the practice either to continue the archivolt without any impost, or to make it rest upon the entablature or capitals of pilasters. Elevations of this class are without columns. When alcoves have columns introduced into them, they admit of numerous combinations and much variety of design.

RECITATIVE, language delivered in musical tones, that is, in the sounds of the musical scale. It differs from *air* in having no fixed time or measure, the lengths of the notes depending on the singer, who regulates them according to his own notion of the emphasis and expression required.

RECKLINGHAUSEN. [ARENBERG.]

RECKONING AT SEA is the process of computing the several elements which relate to the determination of the ship's place at any time. The term may include the operations which are

performed in finding the latitude and longitude of the ship, the variation of the needle, &c., from celestial observations; and the part which is independent of these is called the *Dead-Reckoning*. It is this last only which we purpose here to explain.

The reckoning may be said to commence when the ship is on the point of quitting a harbour or road; and the first circumstances to be recorded are the observed bearing and the estimated distance of some remarkable object (*point of departure*) on the coast, whose geographical position is known, together with the *ship's course* (the angle which the line of her path makes with the meridian), and her *velocity*, the last being determined by the log. [Log-Line.] But while a ship is sailing with the wind in a direction oblique to the line of her keel, she is compelled, by the force of the wind and the resistance of the water against her side, to move in the direction of a line which makes some angle with her keel on the side opposite to that from which the wind is blowing; this angle is called the *Lee-Way*, and as it differs for different ships, it must always be determined by trial in some one of the ways proposed in treatises on navigation.

Again, when a ship is sailing either in a current of the ocean, or in a tide near a shore, her velocity and the direction of her motion will be affected by those of the current or tide. The ship is also made to deviate from the course on which she appears by the compass to have sailed, in consequence of a swell of the sea, by which she may be driven in some other direction. This direction must be observed, and the velocity estimated according to the judgment of the seaman.

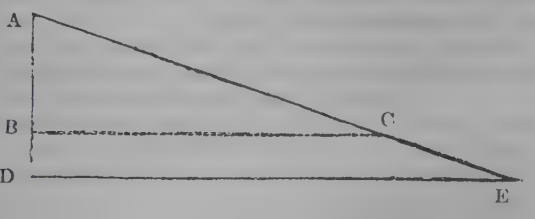
Now, let it be supposed that from the noon of each day to that of the next, according to the practice of seamen, memoranda have been made in a journal, at intervals of two hours or otherwise, of the ship's course, her velocity in *knots*, the direction of the wind, the angular lee-way, with the estimated directions and velocities of the tide or a current, and of the swell of the sea. Then, in order to determine the ship's place at the noon of any day, the following process is used:—

The mean of the number of knots per hour multiplied by the number of hours during which the ship was sailing on one course, gives the distance run in that time; and the declination (variation) of the needle being applied to the observed course and to the lee-way, gives the correct course during that same time. The angular directions of the current, and the swell of the sea, being also corrected for the variation, and the velocities being multiplied by the number of hours, give the correct courses and distances depending on those circumstances. These corrections being made, if the ship is sailing within about 10 degrees on each side of the equator, each of these distances may be considered as the hypothenuse of a right-angled triangle; and, by a graphical construction, by the rules of plane trigonometry, or by the tables of *difference of latitude and departure*, there may be obtained, in each triangle, the distance gained by the ship northward or southward, and eastward or westward: the sum (in the algebraic sense) of the distances in the former direction gives the whole distance gained by the ship during the day northward or southward; and the sum of the distances in the latter direction gives the distance gained during the day eastward or westward. The above process is called *Plane Sailing*.

Should a ship sail for a short time in a direction due east or due west, so that it may be considered without sensible error as sailing on the circumference of a parallel of latitude, its place is determined on dividing the number of miles given by the log by the cosine of the latitude. The result is the amount of longitude gained in the time. This is called *Parallel Sailing*.

The process called *Middle-Latitude Sailing* is as follows:—Multiply the sum of all the distances made by the ship, while sailing on one course, by the cosine of the course for the amount of latitude gained: in order to find the amount of longitude gained, multiply the sum of the distances by the sine of the course, and divide the product by the cosine of a latitude which is an arithmetical mean between the latitude of the ship at the commencement and at the end of the course.

In order to determine, by what is called *Mercator's Sailing* [Mercator's Projection], the ship's place when a course and distance are given, a method in accordance with the following construction is used. Let AD be the direction of the meridian passing through the ship at A, and



BAC be her course; then, if AC be made equal to the distance in miles by a scale of equal parts, and BC be drawn perpendicular to AD, AB and BC measured on the same scale will be the difference of latitude and departure as in plane sailing. Now, if AD be made, by the same scale, equal to the difference between the meridional parts which, in the *table of meridional parts* given in any treatise on navigation, correspond to the latitudes of the points A and C, and DE be drawn parallel to BC, DE on the same scale will express, in miles or minutes, the true difference between the longitudes of A and C.

The inaccuracies in the estimates of the distances run, the effects produced by currents, &c. must, in time, render the results of the reckoning very erroneous; and therefore it is of the utmost importance to correct them frequently by celestial observations. The determination of the latitude by meridional or other altitudes is easy; and that of the longitude by lunar distances or by chronometers should be made as often as possible. Every geographical position thus determined with precision serves, by comparison with the results of the dead-reckoning, to lead to a knowledge of the causes of the errors which exist in the latter,

and becomes a point of departure for the next succeeding portion of the voyage.

RECOGNISANCE is an obligation or record, entered into before some court of record, or magistrate duly authorised, by which the party entering into it (the cognizor), whose signature is not necessary, acknowledges (recognises) that he owes a sum of money to the king, or to some private individual, who is called the cognizee. This sum is named the amount of the recognisance. The acknowledgment is generally followed by an undertaking on the part of the cognizor to do some act, such as to keep the peace, to pay a sum of money, to attend to give evidence, and the like. On the performance of this act the cognizor is discharged from his recognisance. On his default, the recognisance is forfeited, and he becomes indebted absolutely to the amount of the recognisance. If the recognisance is made to the king, it was formerly, in all cases of forfeiture, estreated into the exchequer, and afterwards recovered by process from that court to the use of the treasury. But now, in the cases of forfeited recognisances taken before the court of quarter-sessions, or justices of the peace, provision is made by stats. 3 Geo. IV. c. 46, and 4 Geo. IV. c. 37, for their enrolment among the sessions records, and their immediate recovery by the sheriff.

RECONNOISSANCE is an examination of a tract of country or of the sea-coast; the latter previously to a disembarkation of troops, and the former preparatory to the march of an army in order either to meet that of the enemy or to take up quarters for the season.

The *military reconnoissance* of a country is a duty appertaining to the officers on the staff of the quartermaster-general; and if the enemy is in the neighbourhood, it is performed under the protection of an armed force. It is considered as one of the most essential operations connected with the tactics of the field, and serves as the basis of every movement or combination which it may be proposed to make.

Those who are charged with this duty should be habituated to the performance of topographical surveys: in the first place by the most accurate methods and with the best instruments; and, secondly, by such methods as admit of being practised rapidly on foot or on horseback. In these cases a compass held in the hand must be used for observing the angles, and the distances must be obtained by pacing, or be merely estimated by the eye. A facility in representing on the plan the inequalities of the ground is also highly necessary.

Whether it be required to make a complete plan of the tract to be reconnoitred or not, the survey should be accompanied by a report or memoir, stating the distances, by the different routes, between the position occupied and that to which the army is to proceed, with the places where troops may halt for repose or to form in order of battle; distinguishing particularly the plains where cavalry may act, and the heights on which artillery may be placed. The nature of the roads should be described, with indications denoting that they are passable for artillery, for cavalry, or merely for infantry; and if defective, estimates should be made of the materials and time requisite for repairing them. It is particularly necessary to state whether the ascents and descents are gentle or abrupt; and, when the road is on the side of a hill, whether it is sufficiently level to allow artillery or carriages to pass safely: it should also be noticed whether or not, at places where roads run through towns, they are reduced to narrow and winding streets. The breadths and velocities of rivers, streams, and canals which cross the lines of march should be ascertained, and a statement made whether the beds are rocky, gravelly, or muddy; also whether the banks are high or low. Mention should also be made of the means which exist for passing them; of the places where they are fordable, where there are ferries or bridges, or where boats may be procured. The situations and extent of marshes should also be shown, and it should be stated whether they are passable or can be made so. In contemplating rivers and marshes as means of retarding an advance of the enemy, it should be ascertained and reported whether, by being dry in summer or frozen in winter, they may not at times cease to be obstacles: it should also be stated how, on a retreat, the roads may be blocked up, the fords rendered impassable, or the bridges destroyed.

In a *maritime reconnoissance* the circumstances which it is of most importance to ascertain are: whether the coast is rocky or bordered by downs, and what is the state of the bays or roads with respect to shelter from the prevailing winds; the seasons in which winds blow off and on the shore, and whether the anchorage is secure or otherwise; the nature of the tides, the hours of high and low water, and the depth at either of those times. If it were required to examine the coast preparatory to putting it in a state of defence, it would be necessary to find out what points of land are convenient for the situations of forts or batteries by which the enemy may be prevented from landing, and where beacons may be established for the purpose of giving timely alarm. If there are islands on the coast, it would be proper to include them in the survey, since they might be fortified and made to serve as advanced works; and all places should be indicated which are capable of being converted into military posts to prevent the enemy from penetrating into the interior of the country.

RECORD, a memorial in rolls of parchment of the proceedings and acts of a court of law, upon whose proceedings error will lie. An act of a party which is put on record cannot be varied even in the same term, but a judicial act of the court may be altered during the same term. If a record is lost, the court may order a new entry to be made at any time. In order to prove a record the existence of which has not been denied on the pleadings, an examined copy is sufficient. But if the existence is denied on the pleadings, it can only be proved by the court inspecting the record; and that is conclusive not only as to the existence of the record, but as to all matters stated in it, for the record of a court of competent juris-

diction is a legal proof of all those proceedings having taken place which the record sets forth; and no averment to the contrary in pleading can be made. A record found in the proper office is legally assumed to have been always in the same plight in which it is found. The effect of a reversal of a judgment in error is to annul the previous record from the commencement. ('Co. Litt.,' 117 b., 260 a.; Com. 'Dig.,' tit. 'Record.') It seems doubtful whether in all cases a record must be on parchment. (Reg. *v.* Yeovely, 8 A. and E. 806.) As to what constitutes a Court of Record, see COURTS, and RECORDER.

RECORD, COURTS OF. [COURTS.]

RECORDE, ROBERT, born about 1500, at Tenby, was the first native of Great Britain who introduced the study of analytical science into this country. He studied both at Oxford and Cambridge, and taught mathematics at the latter. He afterwards practised as a physician in London. He died a prisoner in the King's Bench, in the year 1558.

The works of Recorde are all written in dialogue between master and scholar, in the rude English of the time. Recorde's most popular work appeared as early as 1540, under the title of 'The Grounde of Artes, teachinge the Worke and Practice of Arithmeticke.' 'The Pathway to Knowledge,' a brief compendium of geometry, was published at London in 1551.

'The Castle of Knowledge' was published in 1556. This work is written in the form of a dialogue between master and scholar on astronomy, and from the preface we gather that Recorde had not altogether abandoned astrology. It begins with an account of the Ptolemaic system, and afterwards proceeds in an apparently concealed passage to unfold the elements of the Copernican system of the universe. Recorde appears to have been one of the earliest persons in this country who adopted the Copernican system, if not the earliest person who introduced it among us.

In the 'Whetstone of Witte,' which was published in 1557, and is the first English work on algebra, Recorde has amassed together the researches of foreign writers on the subject of algebra, then in its infancy, and has also incorporated several improvements of his own. In algebra we recognise Recorde as the inventor of the sign of equality, and of the method of extracting the square root of multinomial algebraic quantities. All his writings considered together, Recorde was an extraordinary genius; and it must be recorded that he was a lawyer, a physician, and a Saxonist, as well as the first English mathematician of his day.

RECORDER (*Recordator*), a judge, described by Cowel as 'he whom the mayor or other magistrate of any city or town corporate having jurisdiction, or a court of record, within their precincts by the king's grant, doth associate unto him for his better direction in matters of justice and proceedings according to law.' The Norman term *recordeur*, appears to have been originally applied to every person who was present at a judicial proceeding, and to whose remembrance or record of what had taken place the law gave credit in respect of his personal or official weight and dignity.

Since 1835 the duties of recorders in cities and boroughs enumerated in the schedules of the Municipal Corporations Act (5 & 6 Wm. IV. c. 70) have been regulated by the provisions of that and of subsequent statutes.

The jurisdiction of the recorder in places of minor importance than those mentioned in the schedules is taken away. These Acts do not affect the city of London.

The Recorder of London is a judge who has criminal and civil jurisdiction. He is also the adviser and the advocate of the corporation. In respect of the duties performed by the recorder in the assemblies of the corporation, in the courts of mayor and aldermen, of common council, and of common hall, his office may be said to be ministerial. He is by charter a justice of the peace within the city of London, and a justice of oyer and terminer, and a justice of the peace, in the borough of Southwark.

In cities and boroughs within the Municipal Corporations Act, the recorder (who must be a barrister of not less than five years standing) is a judge appointed under the sign manual by the crown during good behaviour: he has criminal and civil jurisdiction within the city or borough, with precedence next to the mayor.

Criminal jurisdiction is given to recorders by the Municipal Corporations Act, explained by subsequent statute.

The civil jurisdiction given to recorders by 5 & 6 Wm. IV. c. 76, § 118, is to try actions of assumpsit, covenant, or debt, whether by specialty or by simple contract, and all actions of trespass or trover for taking goods or chattels, provided the sum or damages sought to be recovered do not exceed 20*l.*, and all actions of ejectment between landlord and tenant wherein the annual rent of the premises does not exceed 20*l.*, and upon which no fine has been reserved, with an exception of actions in which title to land, or to any tithe, toll, market, fair, or other franchise, is in question in courts which before the passing of the Act had not authority to try actions in which such titles were in question. This enactment does not take away the more extended civil jurisdiction which previously existed in particular cities and boroughs by prescription or by charter.

The practice, or mode of proceeding, and also the course of pleading, in courts of civil jurisdiction in cities and boroughs, are governed by rules made by the recorder, and allowed by three judges of the superior courts.

RECORDS, PUBLIC. Records, in the legal sense of the term, are contemporaneous statements of the proceedings in those courts of law which are courts of record, written upon rolls of parchment. (Britton, c. 27.) Matters enrolled among the proceedings of a court, but not connected with those proceedings, as deeds enrolled, &c., are not records, although they are sometimes in a loose sense said to be 'things recorded.' In a popular sense the term is applied to all public documents preserved in a recognised repository; and as such documents cannot be conveniently removed, or

may be wanted in several places at the same time, the courts of law receive in evidence examined copies of the contents of public documents so preserved, as well as of real records.

We may then consider that as a record which is thus received in the courts of justice. England is rich beyond all countries in Europe in ancient written memorials of all branches of its government, constitutional, judicial, parliamentary, and fiscal, memorials authenticated by all the solemn sanctions of authority, and handed down in unbroken series through nearly seven centuries. The amount of public care given to this subject during the last forty years is shown by the appointment of successive commissions and parliamentary committees of inquiry, by a cost in one shape or another amounting to little less than a million of pounds sterling, and by the passing of an Act of Parliament designed to effect a complete change in the system of keeping and using the public records.

The greater part of records are kept as rolls written on skins of parchment and vellum, averaging from nine to fourteen inches wide, and about three feet in length. Two modes of fastening the skins or membranes were employed, that of attaching all the tops of the membranes together bookwise, as is employed in the exchequer and courts of common law, whilst that of sewing each membrane consecutively was adopted in the chancery and wardrobe.

The material on which the record is written is generally parchment, which, until the reign of Elizabeth, is extremely clear and well prepared. From that period until the present, the parchment gradually deteriorates, and the worst specimens are furnished in the reigns of George IV. and William IV. The earliest record written on paper, known to the writer, is of the time of Edward II.

All the great series of our records, except those of parliament, are written in Latin, the spelling of which is much abbreviated, and in contractions, there can be little doubt, derived from Latin manuscripts.

During the Commonwealth, English was substituted; but soon after the Restoration, Latin was restored, and the records of the courts continued to be kept in Latin until abolished by Act of Parliament in the reign of George II. In certain branches of the Exchequer, Latin continued in use until the abolition of the offices in very recent times. Many of our statutes from Edward I. to Henry V., and the principal part of the rolls of parliament, are written in Norman French. Petitions to parliament continued to be presented in Norman French until the reign of Richard II., whose renunciation of the crown is said to have been read before the estates of the realm at Westminster, first in Latin and then in English. After this period we find English, which had doubtless always remained in use among the lower classes, often used in transactions between the people and government.

At the present time, besides the offices for modern records attached to each court, the following are repositories of the public records :—

The Tower of London; Chapter House, Westminster Abbey; Rolls Chapel, Chancery Lane; Rolls House, Chancery Lane; Duchy of Lancaster, Lancaster Place, Strand; Duchy of Cornwall, Somerset House; Common Pleas, Carlton-Ride and Whitehall Yard; Queen's Remembrancer's Records, in Carlton-Ride and Westminster Hall; Augmentation Office, Palace Yard, Westminster; Pipe Office, Somerset House; Lord Treasurer's Remembrancer, Somerset House; Land Revenue, Carlton-Ride; Pell Office, 1, Whitehall Yard; Exchequer of Pleas, 3, Whitehall Yard; First-Fruits Office, Temple.

The fullest examination into the state of the public records which has been made in recent times was effected by a Committee of the House of Commons, in 1800, conducted by Lord Colchester, then Mr. Abbot, and the report of that Committee presents the most comprehensive account which has yet appeared of our public records, to which a period of forty years has added very little. This Report originated a commission for carrying on the work which its authors had begun. The Record Commission was renewed six several times between the years 1800 and 1831, and altogether suspended at the accession of the present queen.

Of the parliamentary grants made to the record commission, by far the greater part was spent in printing, and the expenses connected therewith.

An Act was passed (1 & 2 Vict. c. 49), by which the Master of the Rolls is made the guardian of the public records, and he has powers to appoint a deputy, and, in conjunction with the treasury, to do all that may be necessary in the execution of this service. The old custodyship of most of the offices has been superseded, and the offices are constituted branches of one central depository, the Public Record Office, which, until a proper building is ready, is at the Rolls House in Chancery Lane. The arrangement and repair, as well as the making of inventories of records, have been generally begun in most of the offices.

Preparations are also making for a uniform system of calendaring, a work which a century will hardly see completed. To select what is useful from the judgments of a single court, the Common Pleas for instance, at least 1200 miles of parchment nine inches wide must be patiently read through; and yet without the performance of this labour these records can scarcely be consulted.

The best work of general reference as to the subjects to which the public records relate, is the 'Report of the Select Committee in 1800.'

RECOVERY, COMMON. A common recovery was a judgment in a fictitious suit, in which the tenant of the freehold was the defendant; and the judgment was given in consequence of default made by the person who was last vouched, that is, summoned to warranty in such suit. It was used for the purpose of barring estates tail and all remainders and reversions expectant thereon. By 3 & 4 Will. IV., c. 74, fines and recoveries are abolished, formal defects in those already levied or suffered are cured, and more simple modes of assurance are substituted. The substitution provided by this Act for the barring of an estate tail, and all estates and

interests to take effect after the determination of or in defeasance of the estate tail, is an assurance by deed to be enrolled in the Court of Chancery within six calendar months after its execution.

RECRUITING is the act of raising men for the military or naval service. As to the military service, recruiting is done by officers appointed for the purpose, who engage men by bounties to enter as private soldiers into particular regiments. The officers, commissioned and non-commissioned, while so employed, are said to be on the recruiting service; but the actual engaging of men as recruits is called enlistment. The laws relating to this subject have been already noticed. [ENLISTMENT.]

RECTANGLE (or right angled), the name given to any figure of which all the angles are right angles. Hence the figure, having as many right angles as sides in the sum of its angles, must be four-sided; for none but a four-sided figure has the sum of its angles equal to four right angles. It is unnecessary to give a diagram of the most common of all the forms of art.

The area of a rectangle may be immediately deduced from nothing but the length of its two sides. If as a superficial unit we choose a square having the side A, it may immediately be told how many times and parts of times any other rectangle contains the unit. Measure one side, and see how many times it contains A (say $2\frac{2}{3}$); measure the other side, and see how many times it contains A (say $3\frac{3}{7}$); then the product of $2\frac{2}{3}$ and $3\frac{3}{7}$, or

$$\frac{8}{3} \times \frac{23}{7}, \text{ or } \frac{184}{21}, \text{ or } 8\frac{16}{21},$$

is the number of times which the rectangle to be measured contains the unit rectangle. This rule is abbreviated as follows:—The product of the sides of a rectangle is the area; an abbreviation which often confuses the mind of a beginner, who imagines that two lines can be multiplied together, and that the rectangle, that is, the very shape of the rectangle, is the product; a mistake which is precisely that of a person who should imagine that the very silver of ten shillings could be multiplied by seven yards of stuff, and that the product could be seventy shillings.

The pertinacity with which some writers still persist in calling the product of two lines the area of a rectangle (not only as a practical rule of mensuration, in which it is a desirable mode of expression, but in matters of reasoning) is the result of a long-continued habit formed in the first instance by the study of the Greek writers. For though these do not confound the product with the area; yet, on account of the deficiencies of their algebraical system, they used the area instead of the product, and gave the names of spaces to the results of numbers.

RECTIFICATION means the finding of a straight line equal in length to an arc of a curve [ARC], and is analogous to the term quadrature, as applied to finding its area.

RECTOR, RECTORY. [BENEFICE.]

RECUSANTS are persons who refuse or neglect to attend divine service on Sundays and holidays according to the forms of the Established Church.

There were four classes of offenders under the statutes against recusancy:—Those who absented themselves from the public service of the church from indifference, irreligion, or dissent, were termed 'recusants' simply; after conviction they were styled 'recusants convict;' those absentees who professed the Roman Catholic religion were called 'Popish recusants;' and those who had been convicted in a court of law of being Popish recusants were called 'Popish recusants convict.' Popish recusants were formerly liable to heavy penalties and disabilities, but the 7 & 8 Vic. c. 102, has repealed the offence of recusancy with respect to Roman Catholics.

RED BREAST. [SYLVIADÆ.]

RED MARL. An argillaceous red portion of the series of rocks between the coal and lias is thus termed in geology. Almost identical marls, similarly associated with red sandstones, lie also in the upper part of the coal, and below the coal and mountain limestone.

RED SANDSTONE. In geology this term is used in a variety of senses, partly with reference to the mere colour of certain rocks, and partly as expressing rocks of certain geological periods. Thus we have in the latter sense New Red Sandstone, Lower Red Sandstone, and Old Red Sandstone.

Sandstones or gritstones, generally speaking, consist of abraded and worn pieces of quartz, felspar, mica, and other minerals, such as commonly occur in granite, gneiss, or mica schist, and other rocks associated with these. The size, induration, and colour of these fragments differ very widely. Red sandstones occur in the basin of the Allier in France, in tertiary strata; in the plastic clay group of the Isle of Wight; generally in the strata below the lias and above the coal; in the upper parts of the coal formation of Derbyshire and Lancashire; in the millstone-grit series of Lancashire; in the mountain limestone of the north of England; generally in the strata called old red sandstone, above the strata of the Silurian districts; in the midst of the green and purple slates of north and south Devon; in the midst of older rocks in the Lammermuir, Cavan, and Longmynd ridges; but the most perfect and abundant types are in those parts of the series which lie above and below the carboniferous rocks, and constitute the New and Old Red Sandstone groups. The prevailing colour is mainly derived from peroxide of iron.

A remarkable and general fact observed in studying these red rocks is the paucity of the remains of animals of every grade. The explanation which seems most probable is, that water in which by any cause abundance of peroxide of iron has been diffused is rendered thereby unsuitable for the due performance of the vital functions of aquatic creatures.

RED SEA. This sea is a portion of the Indian Ocean, with which it is connected by the Gulf of Aden and the Strait of Bab-el-Mandeb. It extends from this strait (12° 40′ N. lat.) in a north by west direction to 30° N. lat. It lies between

32° 20′ and 43° 30′ E. long. The length is nearly 1400 miles. The width at the Strait of Bab-el-Mandeb is about 16 miles. The greatest width is nearly 200 miles. Of the two arms, into which the Red Sea branches off at Ras Mohammed, the eastern is called Bahr-el-Akaba, and the western Bahr-el-Suez. Between these two gulfs is the mountain-region of Mount Sinai or Jibbel Musa (Mount of Moses). The Bahr-el-Akaba branches off in a north-eastern direction, and extends more than 100 miles, with an average width of less than 15 miles. The Bahr-el-Suez runs in a north by west direction to its extremity at the town of Suez, a distance exceeding 180 miles; its average width is 20 miles. The surface of the Red Sea is nearly 180,000 square miles.

The Red Sea is of great depth, amounting in some places to 230 fathoms. The navigation is rendered difficult by islands, reefs, sand-banks, and the prevailing winds. The islands, of which there are several rocky groups, are chiefly near the eastern shore. The Red Sea is the most northern portion of the ocean in which coral reefs occur, and they are more numerous than in any other part of the sea of equal extent. They differ in their form from those which are found in the Pacific Ocean, never having a round figure, but almost always extending in a tolerably straight line, and parallel to the coast.

The Red Sea occupies the lowest portion of a deep valley which lies between the elevated table-land of Arabia on the east, and the high lands of Abyssinia, Nubia, and Egypt on the west. The outer edge of these table-lands is generally from 10 to 30 miles from the shores and has the appearance of a continuous mountain-range, varying in height between 3000 and 6000 feet. The space between them and the shores is partly occupied by hills, which skirt the edges of the table-land, and partly by a low and level tract along the sea, which is generally sandy, but sometimes swampy. The position of these table-lands has great influence on the direction and force of the winds which blow over the surface of the Red Sea.

The principal harbours on the Arabian shores are Mokha, Hodeidah, and Jiddah; and on the African, Suez, Cosseir or Cosire, Suakin, and Massowah. There is a pretty active communication kept up between these places, especially by the numerous pilgrims who visit Mecca and Medina from the eastern countries of Africa. As the countries along the shores of the Red Sea do not produce many articles of export, they are not much visited by foreign vessels. The communication with India, especially the transit of the Indian mails, is now made overland through Egypt and by steam-vessels up and down the Red Sea and across the Arabian Sea and Indian Ocean.

The first mention of the Red Sea occurs in the Bible, on the occasion of the Israelites passing through it. Soon after that time, if not before, it seems to have been navigated. In the time of Solomon the advantages of such a navigation were well understood. A connection existed between the Red Sea and India before the time of Alexander, though it was not the most common channel by which the exports of India reached the Mediterranean. This intercourse continued to increase in subsequent centuries, until the discovery of the route round the Cape of Good Hope directed the whole commerce of India into a different channel. The commerce and navigation of the Red Sea were for a time nearly annihilated by this event.

REDAN is the simplest kind of work employed in field fortification, and it consists generally of a parapet of earth, divided, on the plan, into two faces, which make with one another a salient angle, or one whose vertex is towards the enemy. Existing alone, the work is capable of making but a feeble defence, but it is of use at an outpost, to afford a momentary cover for troops who are to retire when a superior force advances against them. A redan may however be advantageously placed to cover the head of a bridge, the entrance into a village, or defend the ground in front of some strong redoubt; a series of them may also be constructed along the front of an army, in order to strengthen the position and cover the artillery.

A redan is sometimes now made with one flank, or two, and in the latter case, it resembles the work Y. [FORTIFICATION.]

REDI, FRANCESCO, born at Arezzo in 1626, studied at Florence and Pisa, and took his degree of M.D. in the last-named university. He afterwards proceeded to Rome and Naples, where he applied himself to natural history, and made several curious physiological experiments. On his return to Tuscany, he practised medicine with great reputation, and wrote several works concerning that science. His chief works were: 'Esperienze intorno alla Generazione degli Insetti,' Florence, 1668; and 'Osservazioni intorno agli Animali viventi che si trovano negli Animali viventi,' 1684. Redi was also a poet of some celebrity, and several works, besides those mentioned, are given in the general collection, 'Opere di Francesco Redi,' 3 vols. 4to., Venice, 1712. Redi was a most correct and elegant Italian writer, and also one of the most learned men of his age and country. He died at Pisa, in 1698.

REDON. [ILLE-ET-VILAINE.]

REDOUBT is a general name for nearly every kind of work in the class of field fortifications: thus a redan with flanks, a parapet enclosing a square or polygonal area, a work in the form of a star, and a fort with bastions at the angles, are occasionally so called; but the second of these is the work to which the term is more particularly applied, and it is that which we purpose now to describe.

When a work to be constructed on level ground is intended to contain troops and artillery for the purpose of preventing the enemy from occupying the spot, and when there is an equal probability that the work may be attacked on any side, that spot should be quite enclosed by the parapet; also if the defence is to continue only till succour can arrive from the army in the vicinity, flanking defences being then scarcely necessary, a quadrangular figure may suffice for

the plan of the work, and there can be no reason why one side should be longer than another, or why the sides should form with each other any but right angles. But when the redoubt is to occupy an eminence whose figure on the plan is irregular, the faces of the work, whatever be the form thus produced, must necessarily be traced so as to correspond to the different directions assumed by the brow of the height; and if the fire of the work is intended to defend some fixed object, as a pass leading towards it, one of the faces must be perpendicular to the direction of that pass. It may be observed however, that in general the number of faces, though not less than four, should be as few as possible.

Redoubts for the defence of positions are in general intended to contain only about fifty men with three guns; but works in the form of irregular polygons have sometimes been constructed of a magnitude sufficient to contain 1600 men and twenty-five pieces of artillery; and such were the two principal redoubts (on Mount Agraça and at Torres Vedras), formed in 1810, in order to protect Lisbon.

In firing over a parapet, the soldier mechanically places his musket nearly perpendicularly to the direction of the parapet; and it follows that in front of every salient angle of the work there must be an undefended sectoral space, in which, in order to avoid the direct fire from the faces, the enemy may advance to the attack; and on this account it is recommended that the faces of the work should be disposed so that the angles may be turned towards ground which is impassable, or which will not permit the enemy to establish batteries for the purpose of enfilading those faces. When this disposition is not possible, various methods may be adopted by which the troops who man the work might direct some of their fire within those sectors. The simplest of these is to form the interior of the parapet about an angle perpendicularly to the line bisecting the angle; by which means the sectoral space may be directly defended. A second method is that of rounding off the interior of the parapet at the angles; but this has been objected to on account of the divergency of the lines of fire. Ths third method consists in forming the interior of the parapet with indentations, alternately parallel and perpendicular to the capital, each indent being three or four feet long; and a parapet of this kind is said to be *en crémaillère*. The chief objection to this method is that the unsteadiness of the soldiers in firing almost always renders such precision in the formation of the work useless.

The ditch of a redoubt having no flanks, being unseen and incapable of defence from the parapets, it has been proposed, in order to have some means of annoying the enemy when in the ditch, to form an enclosed space there, at two opposite angles, or across the ditch before the middle of one or more of its faces, by timbers planted upright and close together, and covered by a roof of timber and earth; loop-holes, three feet asunder, being cut in the walls that the defenders may be enabled to fire along the ditches.

A row of palisades is frequently planted quite along the ditch of a redoubt. Sometimes also the escarp of the work is fraized, or furnished with palisades planted in an inclined position, and a line of chevaux-de-frize is disposed upon the berme. In order to retard the advance of an enemy, the work is generally surrounded, at a distance not exceeding the range of musket shot, by a single or double abatis, and often by two rows of pits called *trous de loup*.

The magnitude of a redoubt, whatever be its form, is determined by the strength of the garrison and the quantity of ordnance by which it is to be defended, the men being supposed to be lodged within it. In treatises of fortification it is recommended to allow on the area of the terreplein, within the foot of the banquette, twelve square feet for each man, and 324 square feet for each piece of artillery. The British engineers who constructed the works for the protection of Lisbon, allowed, in some cases, two men, and in others, one man per yard in the whole length of the parapet, deduction being made of about 18 feet, on that length, for each piece of artillery in the work.

The crest of the parapet of a redoubt may be about 8 feet above the natural ground, unless the work is to be defiladed from some commanding ground in the neighbourhood, in which case it must be higher. The form of a section or profile of the parapet is similar to that which is used for permanent fortification.

REDRUTH. [Cornwall.]

REDUCTIO AD ABSURDUM. [Absurdum, Reductio ad.]

REDUCTION. This term is used in arithmetic in the well-known sense of the operation of turning one denomination of weights or measures into another; thus shillings may be reduced to pounds, or pounds to shillings. It is also used in the same sense throughout analysis, namely that of bringing one form into another, making one question depend upon another, &c.; in fact, for transformation generally.

RE-ENTERING PLACE OF ARMS is an enlargement of the covered way of a fortress, between a bastion and a ravelin, its rear coinciding with the counterscarp of the ditch, and its front consisting usually of two faces of the glacis, which are disposed at angles of about 100 degrees with the glacis before the neighbouring bastion and ravelin [L, Bastion and Fortification.] It serves as a place for assembling troops previously to making sorties; and the fire from its faces serves to defend the approaches to the salient parts in front of the collateral works.

To diminish the risk of being enfiladed, the front of a Re-entering Place of Arms is sometimes made curvilinear; and the work is frequently retrenched by a reduit. [W, Fortification.]

REFINING is a term applied to various processes in the useful arts, and especially in metallurgy, whereby the substances acted upon are purified by the chemical separation of dross and impurities, and of such foreign matters as may be in combination with them. [Assaying; Lead; Sugar.]

REFLECTION. [LIGHT; OPTICS.]

REFORMATION is the name generally given to the great schism which took place in the Western Church in the first half of the 16th century, and by which about one-fourth of the population of Europe has become separated from the Church of Rome. Of the objects and progress of the Reformation on the continent, the details will be found under the articles CALVIN; LUTHER; MELANCHTHON; ZWINGLI, &c. For England, under HENRY VIII.; EDWARD VI.; MARY; and ELIZABETH; and of CRANMER, CROMWELL, and other distinguished men, by whose exertions it was effected. For Scotland, under KNOX (JOHN), MURRAY, EARL OF, and MARY STUART.

REFRACTION, REFRANGIBILITY. Refraction is the turning of a ray of light, heat, or other imponderable substance, from its direction, when it falls obliquely on the surface of a medium differing in density from that through which it had previously moved. The fundamental law of refraction and the optical effects of this law are shown under the heads LIGHT and OPTICS. For the different refrangibilities of the rays, the articles DISPERSION and ACHROMATIC may be consulted, and for one of the most striking phenomena thence arising see RAINBOW.

Atmospheric refraction of the solar rays after sunset, combined with subsequent reflection, is the cause of twilight, and also of the light thrown on the moon's surface when eclipsed by the earth.

Tables of Astronomical Refractions are given in most collections of Astronomical Tables and in Treatises of Navigation.

REFRIGERANTS are remedial agents which directly diminish the force of the circulation, and reduce the heat of the body or a portion of it, without occasioning any diminution of the ordinary sensibility or nervous energy. The agents which are usually regarded as refrigerants are weak vegetable acids, or very greatly diluted mineral acids; some saline, neutral, or super salts; and cool air, ice-cold water, and externally evaporating lotions. [ANTIPHLOGISTICS.]

REFUGE, HARBOURS OF. In the year 1840 a commission was appointed to inquire into the propriety of establishing Harbours of Refuge in the English Channel. They recommended three places as especially suitable for this purpose, namely Dover, Beachy Head, and Foreness. In 1844 another commission, with extended powers, made further inquiries on the subject. The spots particularly examined were—Foreness, near the North Foreland; Ramsgate; the Brake, or Small Downs; Dover; Dungeness; Beachy Head, East Bourne, and Seaford; Newhaven; Portland and Weymouth; and Harwich. Of these places four were selected, Dover, Seaford, Portland, and Harwich, of which the Commissioners estimate the expense required for the construction of the works which they recommend as follows:—Dover, 2,500,000*l.*; Seaford, 1,250,000*l.*; Portland, 500,000*l.*; Harwich, 50,000*l.* Works have since been commenced at Dover and Portland.

REGA'LIA, the ensigns of royalty. This term is more especially used for the several parts of the apparatus of a coronation. In England, the regalia properly so called are the crown, the sceptre royal, the virge, or rod with the dove, St. Edward's staff, the orb or mound, the sword of mercy, called Curtana, the two swords of spiritual and temporal justice, the ring of alliance with the kingdom, the armillæ or bracelets, the spurs of chivalry, and sundry royal vestments. The regalia here enumerated, all but the vestments, are preserved in the Jewel-Office in the Tower of London.

REGALS, a small portable finger-organ, well known during the 16th and 17th centuries, and probably much earlier, but not now in use.

REGEN, now the Upper Palatinate, a circle of the kingdom of Bavaria, is bounded N. by the circle of Upper Main, N.E. by Bohemia, S.E. by the circle of Lower Danube, S. by that of Isar, S.W. by that of Upper Danube, and W. by that of Rezat. The area is 3694 square miles, and the population in 1847 was 467,606. The Danube passes through the circle from Ingolstadt to Wirth, and divides it into two unequal parts. The southern portion, which is the smaller, is generally level and very fertile; the eastern and northern part is rugged and mountainous. The soil to the north of the Danube is generally poor, and extensive tracts are covered with sand or with bare rock. In the north of the province rye, oats, potatoes, flax, hemp, and hops are grown, and here and there tobacco. The great forests constitute the wealth of the northern part, as they enable the inhabitants to keep up numerous iron and glass works. The breeding of cattle, oxen and swine is attended to. Fish and game abound. Coal and iron mines are worked, copper, lead, and sulphur are found. Besides iron and glass factories, there are potteries, paper-mills, breweries, spirit distilleries, and in some districts considerable linen manufactures. The chief towns are—RATISBON: AMBERG: and *Ingoldstadt*, which is situated on the left bank of the Danube, 31 miles W. by S. from Ratisbon, and has a population, including the garrison, of about 9000. Its fortifications were demolished by Moreau in 1800; but it has been recently fortified on an improved plan. The town is well built, but old and gloomy. The most important buildings are the church of St. Mary, and the buildings of the former university, which was transferred to Munich in 1800. Broad-cloth, playing-cards, leather, and beer, are manufactured.

REGENSBURG. [RATISBON.]

REGENT, REGENCY. These words, like *rex*, contain the same element as *rego*, 'to rule,' *regens*, 'ruling;' and denote the person who exercises the power of a king without being king, and the office of such a person, or the period of time during which he possesses the power. Wherever there has been an hereditary kingly office, it has been found necessary sometimes to appoint a regent. The cases are chiefly those of (1) the crown devolving on a minor too young to execute any of the duties belonging to it; (2) mental incapacity of the person in whom the kingly office is vested; (3) temporary illness, where there is a prospect of the long continuance of the disease,

and of incapacity in consequence; (4) absence from the realm. But in the first case the regent has usually been called in England by the name of Protector; the latest instance was the minority of Edward VI., when his uncle, the Duke of Somerset, was the Protector.

In the earlier periods of English history we have several instances of protectors during minorities, and some of regencies during the temporary absence of the king. The occasional absences of George I. and George II. on visits to their continental dominions rendered the appointment of regents a matter of convenience, if not of necessity. Sometimes the power was put, so to speak, in commission, being held by several persons jointly; but Queen Caroline sometimes discharged the functions of regent during the absence of George II.

When George III. was incapacitated for discharging the functions of royalty by becoming insane, a question arose, whether the heir apparent, being of full age, and the king's eldest son, did not become of right regent. The Whig party of the time, led by Mr. Fox, contended that he did. On the other side, it was maintained that it lay with parliament to nominate the person who should be regent. No regent was at that time appointed, because the king recovered. When the king was a second time incapacitated, all parties agreed in conferring the title and office of regent on the Prince of Wales, then heir apparent. But it was done by parliament, who laid certain restrictions upon him during the first year; but in the event (which event did happen) of the continued incapacity of the king, he was to enter into the full possession of all the powers of king, as if the king were dead; using, however, only the name of regent, not king.

REGGIO. [Modena; Rhegium.]

REGIMENT, a body of troops, whether infantry or cavalry, forming the second subdivision of an army. The union of two or more regiments or battalions constitutes a brigade, and two or more brigades make up a grand division, or corps d'armée. A regiment is commanded by a colonel, a lieutenant-colonel, and a major, whose several ranks are graduated so as to correspond to those of the general officers who command the army or division; and when a regiment is divided into two or more battalions, each of these has, at least when complete, its own lieutenant-colonel and major.

REGIOMONTA'NUS, the adopted name of a celebrated German astronomer, whose real name was Johann Müller. He was born June 6, 1436, probably at Königsberg in Franconia.

About 1452–3 he became the pupil and intimate friend of Purbach, who was at that time professor of astronomy in the university of Vienna. Under Purbach's direction he applied himself zealously to the Greek astronomy, through the medium of such Latin versions of the 'Almagest' as existed; and commenced a series of astronomical observations.

Purbach had undertaken a new Latin translation of the 'Almagest,' but, dying suddenly, the completion of the work devolved upon Müller. Upon Purbach's death (1461), Müller accepted the vacant professorship of astronomy in the university of Vienna, on condition of being permitted to reside for some time in Italy, in order that he might there, in compliance with Bessarion's suggestion, acquire a knowledge of the Greek language.

While in Italy he composed his work entitled 'De Triangulis Planis et Sphæricis,' published at Nürnberg, in 1533, fol., fifty-seven years after the author's death, which is now the most interesting of his works. Its second edition contains two tables of natural sines, one to a radius 6,000,000, the other to a radius 10,000,000, and by their means all the cases of plain and spherical triangles were solved, without the aid of a similar table of tangents, the utility of which he did not perceive. While in Italy he likewise detected many errors in George of Trebizond's version of the 'Almagest,' which he severely criticised. This excited so much animosity, that some have attributed Müller's early death to poison administered to him by one of the sons of Trebizond.

The earliest edition of Purbach and Müller's translation of the 'Almagest' appears to be that of Venice, 1469, fol.

After some years' residence at Vienna, Müller was invited by the king of Hungary (Matthias Corvin) to take up his abode at Buda, where he amused himself with collating the Greek MSS. which had been brought from Athens and Constantinople, and in constructing 'tables of directions,' in which he shows himself no less attached to astrology than to astronomy. The state of Hungary induced him, in 1471, to remove to Nürnberg, where he formed an intimacy with a wealthy citizen, Bernard Walter, at whose expense several astronomical instruments were constructed, and a printing-office established. With these instruments a series of observations were made which afforded abundant proof of the inexactitude of the Alphonsine Tables. They were published in 1544, for the three metonic cycles commencing 1475, 1494, and 1513, which was probably the first printed almanac that appeared in Europe. This work must not be confounded with his larger 'Ephemerides.' Pope Sixtus IV., who contemplated a reformation of the calendar, purchased his services. He immediately quitted his old patron Walter, and proceeded to Rome, in July, 1475, where he died on the 6th July of the following year, in the 41st year of his age.

Müller, observes Delambre, was a man of remarkable sagacity, and of an ardent and enterprising disposition. He was without contradiction the most learned astronomer that Europe had then produced. He published many more works, which we have not space to notice.

REGISTER, REGISTRATION, REGISTRY. The mere possession of land is not sufficient evidence of the title to it, except in those cases where it can be shown that it has been held by a party who offers to sell it for such a period as to preclude under the operation of the Statute of Limitations all claims by any other party. In tracing the title to land, a purchaser or mortgagee requires to have the right established by the production of the instruments under which the title

to it is derived; and the usual period during which such title is required to be shown is the last sixty years. This production of the evidence of title is attended with great expense, and does not always give perfect security.

The Real Property Commissioners devoted their Second Report to the subject of a general register of deeds, and they unanimously recommend the establishment of a General Public Register for England and Wales of all deeds or instruments affecting land, in order to secure titles against the loss or destruction, or the fraudulent suppression or accidental non-production of instruments; to simplify titles by rendering in most cases needless the assignment of out-standing terms; to protect them from the consequences of constructive notice; and to render conveyances shorter and more simple.

To a certain extent such registers have been already established in England. By the 27 Henry VIII. c. 16, it is enacted, that all bargains and sales of land shall be enrolled. The 2 & 3 Anne, c. 4 (amended by 5 Anne, c. 18) directs that a memorial of all deeds, conveyances, and wills concerning any lands in the West Riding of Yorkshire may, at the election of the parties be registered; and that any conveyance affecting the same lands shall be deemed void against a subsequent conveyance unless a memorial shall be registered. The 6 Anne, c. 35, establishes a register of the memorials of deeds and wills in the East Riding of Yorkshire. The 7 Anne, c. 20, establishes such a register for Middlesex; and the 8 George II. c. 6, establishes one for the North Riding of Yorkshire, and provides that deeds, wills, and judgments affecting land may be registered at length, instead of the registration of mere memorials of them. In the Bedford Level there is a registration of all deeds affecting land there. These registers, owing to the insufficiency of their indexes, and to some other defects, do not answer all the purposes which might be expected from them, and in many respects the arrangements respecting them are cumbrous and expensive: nevertheless (as the commissioners remark) no one has proposed to abolish them. A registration of wills of personalty has long been established in the ecclesiastical courts. The Act for Abolishing Fines and Recoveries (3 & 4 Wm. IV. c. 74) substitutes for them a deed which is enrolled in the Court of Chancery. In Ireland, Scotland, in the Colonies, in most of the United States, in Sweden, France, and Italy, and in many of the German States, registers are established.

The act 1 & 2 Victoria, c. 110 (abolishing arrest on mesne process, except in certain cases) provides (s. 19) that no judgment of the superior courts or decree of the courts of equity shall affect lands unless a memorandum of such judgment, &c., shall be registered with the senior master of the Court of Common Pleas, who shall enter it under the name of the person whose estate is to be affected by it. The 2 & 3 Vict. c. 11, enacts that these registered judgments shall not be valid for a longer space than five years, but it provides that the entry of them may be renewed; it also enacts that no pending suit (*lis pendens*) shall affect the purchaser or mortgagee with notice, unless a similar memorandum is registered by the same officer, under the head of the person whose estate is affected by it, and the entry must be renewed every five years; and, thirdly, the act requires crown debtors to be registered in the same office, and provides means for obtaining and recording their discharge from their liabilities to the crown; but the act does not require the renewal every five years of the entry in this case.

(*Second Report of Real Property Commissioners; and the Works therein cited;* Tyrrell's *Suggestions for the Laws of Real Property.* As to Registration in Scotland, see the article 'Registration' in the 'Supplement to the Penny Cyclopædia.')

REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES. Parish registers were not kept in England till after the dissolution of the monasteries. The 12th article of the injunctions issued by Cromwell, Henry the Eighth's secretary, in 1538, directs that every clergyman shall, for every church, keep a book wherein he shall register weekly every marriage, christening, and death, any neglect being made penal. In the first year of the reign of Edward VI. (1547) ecclesiastical visitors were sent through the different dioceses in order to enforce various injunctions, and, among others, that of Cromwell with respect to parish registers. In the beginning of Elizabeth's reign this injunction was repeated, when the clergy were required to make a protestation in which, among other things, they promised to keep the register-book in a proper and regular manner. In 1694 an act (6 & 7 Wm. III. c. 6) for a general registration of marriages, births, and deaths, was passed merely for purposes of revenue; it is entitled 'An Act for granting to his Majesty certain Rates and Duties upon Marriages, Births, and Burials, and upon Bachelors and Widowers, for the term of five Years, for carrying on the War against France with vigour.' A supplementary act was passed (9 Wm. III. c. 32), entitled 'An Act for preventing Frauds and Abuses in the charging, collecting, and paying the Duties upon Marriages, Births, Burials, Bachelors, and Widowers.' The 52 Geo. III. c. 146 (28 July, 1812), entitled 'An Act for the better regulating and preserving Parish and other Registers of Births, Baptisms, Marriages, and Burials, in England,' made some alteration in the law, chiefly with reference to having the books made of parchment or strong paper, and to their being kept in dry and well-painted iron chests.

The Registration Act (6 & 7 Wm. IV. c. 86: 17 Aug., 1836), entitled 'An Act for registering Births, Deaths, and Marriages, in England,' came into operation July 1, 1837. By the 44th section of the 6 & 7 Wm. IV. c. 85, entitled 'An Act for Marriages in England,' the provisions of this Registration Act are extended to the Marriage Act.

Another act was passed (1 Vict. c. 22—June 30, 1837), entitled 'An Act to explain and amend two Acts passed in the last Session of Par-

liament, for Marriages, and for registering Births, Deaths, and Marriages, in England.' This act consists chiefly of arrangements necessary to extend and improve the provisions of the former act, and its clauses are not of sufficient interest to the public to require any abstract to be given of them.

Previous to the Registration Act coming into operation (July 1, 1837) it was necessary to divide the country into districts of convenient size for equalising the labours of the registrars, by contracting or expanding the area, according to the amount of population. The registrar-general issued a letter in September, 1836, to the boards of guardians throughout the country, on whom devolved the duty of forming each poor-law union into registration districts, and as the unions differed considerably from each other in population, ranging from 2000 to 8000, the registrar-general left the arrangement to the guardians, simply referring them to certain principles for their guidance. Parishes and townships not under the Poor-law Commissioners were formed into temporary districts, or, where more convenient, were annexed to a district already comprised in a poor-law union. To each district a registrar of births and deaths is appointed, and also a registrar of marriages; and in each union there is a superintendant-registrar, who appoints the registrar of marriages, the registrar of births and deaths being appointed by the guardians.

The total number of registrars of births and deaths at the end of September, 1838, was 2193, of whom 1021 were officers in poor-law unions. At the end of December, 1838, the number of superintendant registrars was 618, of whom 56 were superintendant registrars of temporary districts; at the same period the number of registrars of marriages was 817, of whom 419 were also registrars of births and deaths. In the first year, under the new act, there were registered in England and Wales—

Births	399,712
Deaths	335,956
Marriages	111,814

The registrar-general, in his 6th Report, dated Aug. 10, 1844, states that four inspectors had been appointed to visit every district into which England has been divided, in order to examine into the mode in which the registrars perform their duties.

By the end of 1839 about 350 new register-offices had been built, and the use of temporary offices had been sanctioned in many places. The working arrangements are very convenient; and though in a few years millions of entries will have been made, yet, for legal or other purposes, it will be as easy to find out the name of any individual from among so great a number as it is to find out a word in a dictionary or a cyclopædia.

The births registered in England in 1847 were 539,965, of which 36,125 were illegitimate; the marriages were 135,845; the deaths, 423,304.

REGNARD, JEAN FRANÇOIS, was born at Paris, Feb. 8, 1655. An only son and heir to considerable wealth, he received an education qualified to fit him for the position in life he was likely to occupy. The death of his father soon after he had completed his studies enabled him to gratify his desire for travelling. In 1678, while in Italy, he formed an intimacy with the Eloise whose memory he has consecrated in his pleasing little novel entitled 'La Provençale.' On his voyage home, in which he was accompanied by this lady and her husband, the vessel was captured by pirates, and the whole party were taken captives to Algiers. The adventures of their captivity form the basis of the novel above mentioned. He was, after several years' captivity, ransomed by the French consul. His love of travelling however had not been abated, and on April 26, 1681, he set out from Paris on a journey over the north of Europe. On arriving at Stockholm, he was induced by the King of Sweden to visit Lapland. He journeyed thither by way of Tornea, ascended the river of that name, and reached the borders of the Frozen Ocean. On his return from Lapland he made a short sojourn at the court of Sweden, and, after having travelled over Poland, Hungary, and Germany, came to Paris on Dec. 4, 1683, where, having purchased some lucrative situations under government, he devoted a part of his time to literary pursuits. He has given us ample details of his manner of life, in his 5th epistle and his 'Mariage de la Folie.' His devotion to gaiety and pleasure, as it was the means of lessening his utility and reputation as a writer, was the cause of his untimely death, which occurred Sept. 5, 1710.

As a dramatic writer, the reputation of Regnard stands deservedly high; in comedy he is generally considered second only to Molière. His finest and most perfect production is the comedy of 'Le Joueur,' written in 1696. His next best piece is 'Le Légataire Universel.' He wrote numerous other plays of more or less merit. His other writings are some Epistles and two Satires, one of them directed against Boileau, besides several shorter poems. He wrote also a relation of his various travels.

The best editions of his works are those by Lequien, published in 1820, 6 vols. 8vo., and by Crapelet in 1822 and 1823, 6 vols. 8vo.

REGRATING. [FORESTALLING.]

REGULAR FIGURES, POLYGONS, SOLIDS, POLYHEDRONS. A regular polygon, meaning one of which all the sides are equal, and all the angles are equal, may have any number of sides from three upwards. The Greek terms trigon, tetragon, pentagon, hexagon, heptagon, octagon, nonagon, decagon, undecagon, dodecagon, are in use (except the two first) to express polygons of three, four, &c., up to twelve sides. The term quindecagon is in use to express the polygon of fifteen sides. The regular polyhedrons are five in number—the tetrahedron, octohedron, icosohedron, bounded by four, eight, and twenty equilateral triangles; the hexahedron, or cube, bounded by six squares; and the dodecahedron, bounded by twelve regular pentagons.

RE'GULUS. A line drawn from the pole star, not through the two pointers, but between them

and the five secondary stars of the Great Bear, which lie near them, will pass through the bright star called α Leonis, or Cor Leonis (the lion's heart). By Ptolemy and other Greeks it was called $\beta\alpha\sigma\iota\lambda\iota\sigma\kappa\sigma\varsigma$, the translation of which is the Latin word Regulus, a word which is the diminutive of *rex*.

REICHA, ANTOINE-JOSEPH, a musical composer and theorist, was born at Prague in 1770, and completed his studies at the University of Bonn. His uncle having been appointed Maître de Chapelle to the Elector of Cologne, placed his nephew in the same service. On the French invasion in 1794 Reicha sought refuge in Hamburg. He removed to Paris in 1798, and there produced a grand symphony which met with applause. In 1802 he proceeded to Vienna, and resided six years in that capital. During that period he published an oratorio, and a collection of fugues. In 1808 he returned to Paris, and gave a course of lectures on composition, which were well attended; and some quintets for wind-instruments, which he there produced, were much admired. But an opera, 'Cagliostro,' which he gave in 1810 at the Opéra Comique, was allowed only a single representation, and that a stormy one. In 1816 he produced, at the Académie Royale de Musique, 'Nathalie, ou la Famille Suisse,' and in 1822 'Sappho;' but both of them were unsuccessful, and he then prudently renounced the composition of operas; and having been named professor at the Conservatoire de Musique, on the death of Mehul, in 1818, he there attracted a numerous class of pupils. He originated a method of instruction more clear and precise than any that had been in use; and the publication of his didactic works, which soon made them known in most parts of Europe, has in no inconsiderable degree improved the study and advanced the knowledge of music. These opened to him the doors of the Institut de France in May 1835. He died in May 1836. His chief works on the theory of music are—1, 'Traité de Melodie,' &c. 4to., 1814; 2, 'Cours de Composition Musicale,' 4to., 1818; 3, 'Traité de Haute Composition,' 4to., 1824; 4, 'Petit Traité d'Harmonie Pratique à deux Parties,' 4to.; 5, 'Art du Compositeur Dramatique,' 4to., 1833; and many articles on music in 'l'Encyclopédie des Gens du Monde.'

REICHENBACH. [SILESIA.]

REICHENBERG, a town in the circle of Bunzlau, in Bohemia, is situated on the river Neisse, 52 miles N.N.E. from Prague, and has 10,000 inhabitants. The principal buildings are —the church called Kreuz Kirche, two palaces, a theatre, and a large school-house. There are four great woollen cloth factories, with fulling-mills and dyeing-houses. There are besides breweries, spirit distilleries, manufactories of stockings, hats, linen, and calico.

REICHENHALL, a town in the circle of the Isar in Bavaria, is situated in a romantic country on the left bank of the Saale, at an elevation of 1323 feet above the level of the sea. Though it has not 3000 inhabitants, it is a place of great importance, as being the central point of the four great salt-works of Bavaria. The salt-springs seem to have been turned to profit ever since the eighth century. As the great consumption of wood for so many years made fuel too scarce to boil all the brine on the spot, a very ingenious system of hydraulic machinery was contrived in 1618 to carry the brine in iron pipes from Reichenhall to Traunstein, over an elevation of 828 feet perpendicular height, and extending 21 miles in length. A similar conduit 42 miles long to Rosenheim on the Inn, where there is abundance of wood, was made in 1809; so that now all the springs which formerly ran to waste for want of wood are turned to account. In 1817, the salt-springs of Reichenhall, Traunstein, and Rosenheim were connected by hydraulic works of great power and ingenious contrivance with the salt-mines of Berchtesgaden. The salt produced annually is 16,000 tons.

REID, DR. THOMAS, was born April 26, 1710, at Strachan in Kincardineshire, of which parish his father was minister for fifty years. At the age of twelve or thirteen he entered Marischal College, Aberdeen, where he was afterwards appointed librarian. This office he resigned in 1736, and he then visited England in company with Dr. John Stewart. In 1737 Reid returned to Scotland, and was presented by King's College, Aberdeen, to the living of New Machar in Aberdeenshire. In 1740 he married the daughter of his uncle Dr. George Reid, a physician in London.

In 1748, while he was minister of New Machar, he inserted in the 'Transactions' of the Royal Society of London, 'An Essay on Quantity, occasioned by a Treatise in which simple and compound Ratios are applied to Virtue and Merit.' In other words, it was an essay on the application of mathematics to morals. In 1752 the professors of King's College, Aberdeen, elected Reid professor of moral philosophy. In 1763 he was appointed professor of moral philosophy at Glasgow university. In the following year he published his 'Inquiry into the Human Mind,' the principal object of which was to counteract the influence of that scepticism which Hume had founded on the spiritual and ideal system of Berkeley. About the time that the 'Inquiry' was published, the author received the degree of D.D. from the university of Aberdeen. In 1773 he published, in Lord Kames's 'Sketches of the History of Man,' 'An Analysis of Aristotle's Logic,' which he wrote at the particular request of Lord Kames. In 1781 Dr. Reid withdrew from public labours; but he did not cease to pursue his favourite occupations. He died Oct. 7, 1796. After his death, his 'Essays on the Intellectual and Active Powers,' which had appeared separately several years before, were published by Mr. Dugald Stewart, as 'The Philosophy of Dr. Reid,' with a life of the author. An edition of the 'Works of Dr. Thomas Reid on the Human Mind' was published by Sir Wm. Hamilton in 1847, 8vo.

REIGATE. [SURREY.]

REIMARUS, HERMANN SAMUEL, was born at Hamburg, December 22, 1694. Early in life he devoted himself to the study of languages, and he became distinguished for his knowledge of the Latin, Greek, and Hebrew. In 1727 he was made professor of philosophy in the university of Hamburg, a place which he filled with honour for

forty-one years. In 1728 he married a daughter of J. A. Fabricius. Reimarus died March 1, 1768. He was a man of great learning, of unwearied industry, and high character. The work by which he is generally known is his valuable edition of 'Dion Cassius,' Hamburg, 1750, 2 vols. folio. He also wrote a commentary on the Life and Writings of his father-in-law, on the principal truths of natural religion, and various other works.

REIMS, a city in the French department of Marne, stands on the right bank of the Vesle, a feeder of the Aisne, 80 miles E. by N. from Paris, in 49° 15′ 15″ N. lat., 4° 1′ 49″ E. long., and has 40,776 inhabitants. It is mentioned by the name of *Durocortorum* by Julius Cæsar, in whose time it was the capital of the Remi. At a later period it took the name of Remi from the people to whom it belonged. Under the Roman Empire it was the capital of Belgica Secunda; and was distinguished by its literary character. The city embraced Christianity in 360, and soon after gave title to a bishop. In 494, after the defeat of Syagrius at Tolbiac, the city was occupied by Clovis, who with his Frankish lords received baptism here in 496 at the hands of St. Remi, then bishop of Reims. In 744 the see of Reims was raised to an archbishopric. In 1179 it was signalised by the consecration of Philippe Auguste; all the succeeding kings of France down to Charles X. inclusive have also been consecrated here, with the exception of Henri IV., Napoleon, and Louis XVIII. In 1359, the city was blockaded for seven months by the English, who were at last forced to raise the siege; it submitted to the English in 1421, but they were soon driven out by the Maid of Orleans. In 1814 it was taken, March 12, by the Russians, but retaken next day by Napoleon.

The town, which is in general well built, is situated in a vast basin surrounded by chalk hills, on which good wines are produced. [MARNE.] The ramparts, which are about three miles in extent, and pierced by six gates, are strengthened with towers, and, being planted with trees, form a very agreeable public walk. They inclose within their circuit many large gardens and squares. The town is supplied with water raised by a hydraulic engine from the Vesle to a reservoir outside the walls, whence seventeen fountains in different quarters of the town are fed. The streets are wide, well paved, and neatly laid out. The houses are for the most part built of chalk, or of boards covered with slate; some of them present their gables to the street; and in others the upper stories project, and, being supported on wooden columns, form on the ground-floor a covered walk or gallery. The Place-Royale, which probably has now (Feb. 1850) a different name, is a regular square, surrounded by good houses or public buildings of mingled Doric and Italian architecture; in its centre is or lately was a statue of Louis XV.

The most striking public building is the cathedral of Nôtre-Dame, one of the finest Gothic edifices in Europe. It was commenced in 1210 on the site of a more ancient church, which had been destroyed by fire; and was opened for divine service in 1241. The entire length of the interior

is 466 feet, the breadth 99 feet, and the height 144 feet. The west front, which is surmounted by two square towers that rise to the height of 267 feet, is pierced by three magnificent arched doors decorated with a profusion of statues, bas-reliefs, and other ornaments of exquisite workmanship. Over the principal doorway is a splendid rose-window of stained glass. The shafts of the flying buttresses, surmounted with statues, the rose-windows over the side-doorways, and the Angel Tower, a remarkably light bell-tower rising 59 feet above the roof of the church at the eastern end, surmounted by a ball, and by the statue of an angel from seven to eight feet high, are all worthy of attention. The interior of the church is also very striking from the vast extent of the nave, the splendid stained-glass windows, the side chapels, the pavement of the choir, inlaid with marble of various colours, the ancient baptismal fonts, the organ, and the fine paintings and tapestry that adorn the walls. The ancient tomb of Flavius Jovinus, a native of Reims, who held a high office in Roman Gaul, and embraced Christianity in 366, was transferred from the ruins of the ancient church of St.-Nicaise in 1800 to the right of the nave of the cathedral.

The church of St.-Remy, the most ancient in the town, dates from 1041, and is almost as large as the cathedral, but not so lofty. The interior is remarkable chiefly for the tomb of St.-Remy, an elaborate piece of workmanship, erected in 1803, partly from the remains of the more ancient one destroyed in 1793. The other remarkable structures are—the town-hall completed in 1825, and containing a library of 25,000 volumes, and 1000 MSS.: several ancient hotels and other houses, many of which are marked with inscriptions commemorative of important events; as the Maison-Rouge, in which the father and mother of Jeanne D'Arc were entertained in 1429; the house called Long-Vêtu in the Rue de Cérès, in which Colbert was born, &c.: and the Mars Gate, a triumphal arch erected in honour of Julius and Augustus Cæsar.

The manufactures are extensive; they consist of woollen cloths, kerseymeres, light stuffs for summer coats and trousers, swanskins, camlets, merinos, cashmere shawls, flannels, blankets, carpets, hosiery, bolting-cloth, cordage, candles, soap, and leather. Wax and wool bleaching, dyeing, wool-combing, brewing, and the making of machinery, are carried on. The spiced bread and biscuits of the town are in great repute. The chief trade is in the above-named articles of manufacture, corn, flour, champagne wines, brandy, spices, colonial produce, wool, cotton-yarn, flax, hemp, raw hides. There are four yearly fairs. A railway in course of construction will join Reims to the Paris-Strasbourg line, on which it abuts a little E. of Épernay.

Reims has an assize court, a tribunal of first instance and of commerce, a chamber of commerce, an exchange, a council of Prud'Hommes, a national college, two ecclesiastical schools, four hospitals, one of which, the Hôtel Dieu, occupies the buildings formerly belonging to the Benedictine Abbey of St.-Remy, two bathing establishments, and a large theatre.

(Marlot, *Histoire de la Ville, cité, et Université, de Reims* 1843-4; *Dictionnaire de la France.*)

REINDEER. [DEER.]

REINEKE FUCHS, or *Reynard the Fox,* is a poem which, during the latter part of the middle ages and the early centuries of modern times, in some form or other, was known and read all over Europe. The first complete version of the story was printed in 1498 at Lübeck, and bears the title 'Reynke de Voss.' It is written in the Frisian dialect, which is a modification of that spoken in Lower Saxony. The poem contains a lively picture of a court, in which the prince allows himself to be guided by the flattery of a deceitful and cunning favourite, who, notwithstanding all the wrongs that he inflicts upon others, is still successful to the last. The king is represented under the name of Lion; his friend and favourite is Reineke the Fox.

The first edition is preceded by a prose introduction, in which the author of the German version calls himself Hinrek von Alkmer, and states that he translated the story. But as no trace of this Alkmer can be found, the statement of Rollenhagen, who, in the preface to his 'Froschmaüsler,' calls Nicolas Baumann the author of 'Reynke de Voss,' has generally been adopted, though nothing certain is known of the matter. (Flögel, 'Gesch. de Komisch. Lit., iii., p. 28, &c.) Göthe has made an excellent modernised version of Reineke Fuchs into German hexameters. It was translated from the Dutch into English by Caxton, 1481.

REINE'SIUS, THOMAS, one of the most learned of modern physicians, was born at Gotha in Saxony, on the 13th of December, 1587. After studying at Wittemberg, Jena, Padua, and other places, he settled as a physician at Hof in Franconia, in 1617. He subsequently lived at Baireuth, Altenburg, and finally at Leipzig, where he died at the age of eighty. Reinesius was a man of extraordinary learning. There was scarcely anything in the Greek or Latin writers, especially the ancient medical writers, that he has not noticed in his letters, observations, various readings, or other works, published or in manuscript. Several valuable collections of his letters have been published. He was well versed in Roman inscriptions, and the history of the Roman families. A list of his chief works is given in the article 'Reinesius,' in the 'Penny Cyclopædia.'

REINHOLD, ERASMUS, was born October 21, 1511, at Saalfeld, about sixty miles south-west from Leipzig. He taught astronomy and mathematics in the university of Wittenberg till the year 1552, when, being obliged to quit that city on account of the plague, he returned to his native province of Thüringen, where he died Feb. 19, 1553. His name is well known in the history of science as a distinguished astronomer and an early follower of Copernicus.

REISKE, JOHANN JACOB, a physician, and celebrated scholar, was born on the 25th of December, 1716, at Zorbig, near Leipzig. Reiske spent five years at the university of Leipzig, chiefly in the study of the rabbinical writings and Arabic. He gave up his rabbinical pursuits; but he devoted himself to the Arabic to the end of his life. During a residence at Leyden, where he went to examine oriental MSS., he studied medicine, and on his return to Leipzig he was presented with the degree of doctor of medicine; but he never practised physic. He was very poor, and got his living by working for the booksellers. His labours on the Arabic and the Greek languages in the meantime gained him a reputation, and he was appointed rector of the college of St. Nicholas, in Leipzig. He fulfilled the duties of this office with great diligence. He died in August, 1774.

Besides his labours on the Arabic, he edited many of the Greek and Latin classics; but they were generally executed in a hurry, for the purpose of getting a livelihood. Reiske, though a man of ability and learning, was far from being an exact Greek scholar, and his arrogance frequently led him to make absurd conjectures. An edition of the Greek orators, which he did not live to finish, was completed by his wife, Ernestine Christine, who had been taught Latin and Greek by her husband, and had acquired a considerable knowledge of both languages. During his lifetime this excellent woman assisted her husband in his literary labours; and by her continuation of the autobiography, which her husband left unfinished, she has recorded her attachment to his memory.

REJOINDER. [PLEADING.]

RELAND, ADRIAN, was born at Ryp, a village in North Holland, July 17, 1676. He attained great eminence as an oriental scholar, though he died in his forty-second year, in 1718. At the time of his death he was professor of oriental languages and ecclesiastical history in the university of Utrecht. Among his numerous works the 'Palæstina,' which appeared at Utrecht, 1714, 2 vols. 4to, is one of the best known and the most useful.

RELATION (Mathematics). All reasoning is the discovery of relations which are not evident from those which are; or rather, since the proposed result is sometimes evident in itself, reasoning is the establishment of one relation as a necessary consequence of others. The term relation would be difficult to define in a manner satisfactory to all; it is enough for our present purpose to say, a relation exists between any two objects, whether of sense or intellect, whenever they have anything in common; that is to say, the common point, whatever it may be, may be made the means of referring one to the other, or bringing our thoughts from one to the other, so as to think of both at the same time, and to compare the two. All the manifold senses of the word may be derived from this one; the relationship of blood implies a common ancestry; the relationship of office, common duties. In mathematics the relation of greater, equal, or less, implies that one of the magnitudes is the same as to quantity with part or all of the other, and so on. Sameness in every respect would constitute identity; sameness in one or more respects, relation.

It might perhaps be said that though we constantly use the word relation in mathematics, yet

we consider nothing but identity, that is, either identity of magnitude, form, process, or properties; but that the term in common life refers to something short of complete identity, frequently meaning mere connection, and sometimes only analogy, or even nothing more than resemblance. We answer, that relation always refers to identity of some sort. For example, there is a relation between the position of the sun and moon and the state of the ocean. Here the word means merely a connection; but this connection involves an absolute identity: having given the position of those heavenly bodies with respect to any place, together with the direction and quantity of their motions, the height of the water at that place is connected with the quantities which express those positions and motions by an equation or a mathematical identity. Resemblance again means identity in some respect, or near approach to identity: analogy, a term generally applied to relations of similarity, will be found to admit of the word sameness being used instead of similarity. Thus, when we say that substance is formed from *substare* in a manner similar to that in which distance is formed from *distare*, the analogy asserted is one of absolute identity (of mode of derivation).

Reasoning by analogy is either the same thing as common reasoning; or else analogy is but another word for induction. If A give B, and C have something in common with A, it may be a necessary consequence that C gives D; D being connected with C in the same manner as B with A. But this happens only when the following of B from A is a necessary consequence of that which A and C have in common, and of that only: in which case the deduction of D from C by analogy with the deduction of B from A, is only an assertion of the possibility of applying the same mode of proof to that part or property of C which was previously applied to the same part or property of A. But when we conclude by analogy of a horned animal that it is not carnivorous, as it is said; that is, when we conclude that the horned animal of which we speak will resemble all other horned animals which we know, in every point in which they resemble each other, we apply no other process than the establishment of a highly probable result by induction.

RELEASE. Releases are in divers manners, viz.: releases of all the right which a man hath in lands or tenements; and releases of actions personals and reals, and other things.' (Litt. s. 444.)

The former kind of release is a species of conveyance, and the instrument of release must be a deed. The operative words of release are *remise, release, renounce,* and for ever *quit claim* (an abbreviation or corruption of *quietum clamasse*). The parties to a release are the releasor and the releasee: the releasor is he who quits or renounces that which he has; the releasee is he who acquires what the other gives up, but he cannot acquire anything by the release, unless he has some estate in or right to the thing which is the object of the release.

Releases are either of an estate in land or of a right to land; or they are releases of things personal. Releases of estates in or rights to land form a part of the law of the acquisition of real property.

In order that a Release of an estate in land may have its intended effect, there must be privity of estate between the releasor and releasee; that is, the estates of the releasor and releasee must have been acquired by the same conveyance or title, or the one estate must have been derived immediately out of the other. There must be this privity whenever the Release of an estate operates either by way of enlarging the estate of the releasee, or by way of passing to him the estate of the releasor.

A Release, not considered as an instrument of conveyance, is the giving up or discharging of a right of action or suit which one man has against another. This release may be either by act of law or by deed. For instance, if a woman marries her debtor or creditor, the extinguishment of the debt is a legal consequence.

Any words are sufficient for the purpose of a release by deed which clearly express the intention of the parties to the deed. If a man covenants with another that he will never sue him, this is legally construed to be equivalent to a release, because the same end would be ultimately effected by virtue of this covenant, as if there were an absolute release.

All persons may release who are not under some legal disability, such as infancy. A husband may release a debt due to his wife, because he is the person entitled to receive it.

A release may be set aside in equity on the ground of the fraud, a term which will include every act of commission or omission that renders the transaction unfair, such as misrepresentation or suppression of facts important to be known to the releasor.

A release is generally so expressed as to include all demands up to the day of the date of it; but in this case the day of the date is excluded from the computation. If the release extends to all demands up to the making of the release, this will comprehend all demands up to the delivery of it.

RELEGATIO. [Banishment.]

RELICS (in Latin, 'reliquiæ') is a term used to signify the remains, bones, or garments of departed holy men, which are honoured by the followers of the Church of Rome. In the fourth and fifth centuries astonishing miracles were said to be performed by fragments of their bones or garments, and pilgrimages were undertaken to obtain these relics. The use of images and that of relics as accessories to church worship seem to have grown up together during that period, till it became, during the middle ages, a vulgar superstition and disgraceful traffic; and the abuse has been censured by many sincere Roman Catholics. Pope Innocent III. forbade the sale of relics. The Roman Catholic Church however admits that the relics of saints have performed and may still perform miracles; and that they are a proper object of veneration.

RELIEF, RELE'VIUM, a burthen incident to feudal tenures, being a sum of money paid to the lord on the admittance of a fresh tenant. It is a relic of that state of things in which the succession was not strictly speaking of right, but at the will of the lord, who required the payment of such an acknowledgment for the concession. It became however so much the custom for the lords to admit the sons or near kindred (heirs, as we now say) to the inheritance of the ancestor, that a custom became established of doing so, and out of the custom grew the law of inheritance. The money however, which had been paid for admission in the former state of things, continued to be paid when the succession of the next heir had become what is called matter of right.

Bracton gives what is probably the true etymology of the word. 'Relevia,' says he, 'are so called, "quia hereditas quæ jacens fuit per antecessoris decessum, *relevatur* in manus heredum, et propter factam relevationem."'

RELIEF. [Basso Rilievo.]

RELIGION is a Latin word which, according to the common derivation of it (from *religare*), means a principle which acts as a *restraint* on the conduct of man. In its more general sense it is used to denote our ideas of the existence and character of a Divine Being, to whose power men are subject. Thus we speak of *a sense of religion* and *the duties of religion*, and we call a man who regards such subjects as matters of great importance *a religious person*. But as different views have prevailed of the nature of the Deity and the relation in which man stands to him, various systems of religious belief have sprung up, and each of these systems is called *a religion*. Thus we speak of the Greek, Hindoo, Jewish, Christian, and Mohammedan religions. The word is also popularly used to express the attention of individuals to the doctrines and duties of the particular religion which they may have embraced. In this sense it is synonymous with *piety*.

The subjects with which religion has to do are God and man considered in the relation in which they stand to each other. It consequently includes all the questions which can throw light upon that relation; for example, the nature of the Deity, the notions of infinite space and infinite duration, the existence and offices of spiritual beings, the origin and destiny of the human race, the immateriality and immortality of the human soul; and also all the practical questions which arise out of that relation, such as the duties which men owe to God and to each other, and the consequences which God may have appointed to follow different courses of action. All impressions, notions, and belief upon these subjects, whether formed into a system or not, constitute what we call *religion*, as distinguished from *theology*, which is the science by which these ideas are reduced to a systematic form, their laws investigated, and their origin and results traced out.

The sources of religious notions are either the so-called laws of nature and the constitution of the human mind, or direct information given to us by the deity himself, whether such information be embodied in any lasting form, or handed down from one generation to another by oral tradition. Religion derived from the two former sources is called *natural religion;* from the last, *revealed religion*.

The fundamental principle of all religion is the notion of a Being whose power over us is absolute, whose nature is either perfect in excellence, or at least far superior to ours, to whom we owe certain duties, and from whom we have much to hope and fear. The existence of such a Being is proved by the evidences which the objects of nature present of perfect design, of fixed order, of power sufficient to accomplish everything which we can conceive, that does not involve a contradiction, and which we therefore conclude to be infinite, and of benevolent provision for the wants of living creatures. But, apart from all such evidence, a belief in the divine existence seems to be a part of the constitution of the human mind. Lastly, this truth may be the subject of revelation; for revelation does not, as may at first sight seem, imply as a fact *previously* known the existence of the Being from whom it comes. To the first recipients of the revelation the very fact of their finding themselves possessed of the knowledge of truths beyond the range of human experience would be a sufficient proof of the existence of a superior Being, from whom they had, in whatever way, obtained such knowledge; and if, in making known the revelation to the world, these persons should display a command over the laws of nature beyond the compass of human power, or an acquaintance with future events beyond the reach of human knowledge, these miracles and prophecies would prove the existence of a superior Being, from whom they had received the power to perform the one and the foreknowledge implied in the other. Thus the revelation itself furnishes a proof of the existence of the before unknown revealer.

The belief in a God leads to the practice of worshipping him, on the same principle on which all dependents honour and look up to those in whose power they are placed.

The existence of a God once proved, the next question is, in what relation do we stand to him? Are any laws laid down for our conduct? Are we responsible to him for keeping or breaking those laws? Are any rewards and punishments appointed for obedience and disobedience?

To these questions it does not appear that natural religion can give a perfectly satisfactory answer, though Bishop Butler's admirable work, 'The Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature,' shows how much information on these subjects may be derived from the examination of the constitution and order of things. It seems also that a general undefined notion of responsibility is associated in nearly all human minds with the idea of divine existence, at least a sense of responsibility sufficient to excite pleasure when we do what we believe to be good, and remorse when we do what we believe to be evil. Again, the connection which generally exists between vice and misery on the one hand, and virtue and happiness on the other, impresses upon us the idea that there does exist such a thing as retributive justice. But,

though the general law by which the affairs of the world appear to be governed is, that virtue is followed by happiness, and vice by misery, and though a full knowledge of the circumstances of every case which appears an exception to that law might show us that more real happiness is enjoyed by a virtuous sufferer than by a prosperous sinner, yet daily experience furnishes us with exceptions to this law, numerous enough to throw great doubt upon its reality, if the period of human existence ends with the present life. Accordingly we find the doctrine of a future state forming a part of all religious systems, and generally connected with some notion of rewards and punishments. And this again is a branch of religion which, though it may be made to appear probable by arguments drawn from the nature of things, does not appear to be susceptible of satisfactory proof without a divine revelation. In the opening of the Epistle to the Romans there is an admirable though concise argument on the force and extent of natural religion (Rom. i. 19).

Now if there be a supreme moral governor who has appointed rewards and punishments as the recompense for obedience and disobedience, and who has constituted man so that he shall exist in a future state to receive that recompense, the question is naturally suggested whether there be any means by which the consequences of disobedience may be averted. Punishment for offences against law is part of the system of human government, and we cannot conceive government existing without some punishment. The repentance of an offender, however sincere it may be, is never considered a sufficient ground for the remission of punishment. Analogy leads us to conclude that punishment in some kind and degree is inseparable from wrong doing, both in the moral government of the present world and in the next. The notion of justice, which is universal, however vaguely it may exist in most minds, is inseparably connected with the notion of a deity: to conceive him unjust is impossible. We also must conceive the deity as supremely good, and we have evidence of his regard for man's well-being in the constitution and order of things. We must also conceive him as merciful towards the imperfect beings whom he has created. The question then is, how his mercy can be shown consistently with his justice; and the importance of this question is enhanced by the consideration that the great majority of mankind (experience would justify us, apart from the Christian doctrine of universal depravity, in saying all mankind) need the divine forgiveness for at least some actions of their lives. It is the highest province of religion to furnish an answer to this question; and here natural religion entirely fails us, for if left to it, the utmost we could do would be to rest in the exercise of an humble faith that some provision has been made by God for the just forgiveness of our sins, though the nature of that provision be unknown to us. The matter belongs to revealed religion, and accordingly we find in nearly every religion professing to have a divine origin, and in many others, the doctrine of an atonement; that is, of a satisfaction for sin, in virtue of which the actual transgressor may be released from the consequences of his guilt.

On whatever grounds systems of morality may be based by ethical writers, there is in the minds of men in general an inseparable connection between religion and morality, the former furnishing alike the rule and sanction of the latter. The positive morality of any people will always depend on the nature of their religion. The attributes which they attach to the divine character will be a standard for their own conduct, and their opinions respecting the recompense appointed for virtue and vice will determine the strength of the motives on which they act; while their moral system will be greatly affected by their views upon the subject of satisfaction for guilt. When, as is generally the case, the same religious principles are found to pervade a whole community, the positive morality which is formed upon those principles has a direct influence on legislation, and the sanctions and rites of religion co-operate with the rules of law, and thus religion becomes interwoven with the social and political system.

These then are the elements which seem to be contained in any religion suited to the wants of man: that there exists a supreme Being who possesses absolute power over man and the material universe, and all creatures therein, and who is to be worshipped by all his rational creatures; that he has laid down laws for our conduct, by our obedience or disobedience to which we subject ourselves to a recompense of reward or punishment, which recompense is awarded partially in the present life, but more completely in a future state, in which we shall exist after death; that a provision has been made on behalf of those who feel that their conduct has subjected them to the divine displeasure, by availing themselves of which they may escape the consequences of their guilt without detriment to the equity of divine government; and lastly, that there are certain practical rules of conduct by which the intercourse of men with each other ought to be governed, and by an attention to which the stability of the social system may to a great extent be ensured. And all these elements of religion are susceptible of proof, either from nature, or from human experience, or from revelation.

When we look at the different religious systems which have prevailed among the various divisions of the human family, we find the fundamental idea of the divine existence contained in them all; for the testimonies of modern travellers and of ancient history concur to show that, as far as our knowledge extends, there is not nor ever has been a people utterly ignorant of the divine existence, however debased in other respects. Even where polytheism and idolatry have existed in their grossest forms, we can generally trace some notion of a supreme divinity, who is regarded as the origin of all other existences. The character of the worship which is paid to the divine Being is always found to be materially affected by the difficulty of conceiving spiritual objects. Hence the almost universal prevalence of idolatry; of which the earliest form appears to have been the worship of the heavenly bodies, which, as being

the sources of light and heat and all-vivifying power, were regarded as the fittest representatives of the deity.

In most religions the existence of evil in the world is traced to the malignant efforts of a bad Being, who is viewed either as permitted to do evil for a time, with a view to the ultimate accomplishment of greater good, or as being independent in his origin and power of the good divinity, or even so powerful that some nations have sought to appease him by divine honours.

Those religions which are based upon the doctrine of the unity of the deity, are chiefly distinguished from the polytheistic systems by their regarding the divine nature as utterly distinct from all material existences, and as incapable of being represented in any way by means of sensible objects. Hence the Jewish and Christian and Mohammedan religions are irreconcileably opposed to all forms of idolatry.

The different views which are taken of human duty and responsibility, and of the future state of existence, are generally found to depend upon the light in which the deity is regarded. It is not to be expected that men should measure their conduct by the standard of a purer morality than is furnished by the characters of their gods. Accordingly we find in all nations whose religion is polytheistic, that their positive morality has been low, and that their belief in an equitable divine government and in a future state of retribution has been most confused and vague. It is in Christianity alone that we find a code of morals based on the principle of universal love, and a clear announcement of a future state of rewards and punishments.

With regard to the doctrine of satisfaction for sin, we find in most nations some traces of the belief that 'without shedding of blood there is no remission,' and, as a consequence of this belief, the practice of propitiating the deity by sacrifice. In no religion however, except Christianity, do we find any clear or consistent doctrine of the means by which an atonement is provided, and of the course through which individuals must pass to secure the benefits of that atonement. [ATONEMENT.]

In their influence upon the social system, all religions, except Christianity, appear to have failed in producing that spirit of self-restraint and benevolence which is the best security for the peace and prosperity of any community. But in instituting a comparison on this point, we must not judge by the state of things existing in any community which *professes* a certain religion, but we must inquire whether in that community the religion in question exists in a genuine form, as determined by the documents in which its principles are embodied, or by any other test of acknowledged authority. If, for example, there exist any sacred books to which all the professors of any religion appeal as containing the tenets of their religion, we must first refer to them to test the purity of the religious system of a community, before we judge of the influence of that system on society. Tried by this test, we believe it will be found that Christianity, in proportion to the purity in which it has existed in any nation, has tended to produce peace and contentment, benevolence and industry, submission to authority, and regard for the legal rights of every class and individual, to an extent never approached by any nation professing a different religion. But, whatever views may be entertained of the respective powers of different religions in keeping a social system together, this fact at least seems established by evidence, that this object cannot be effected without some religion. All great legislators have used religion as the great bond of their institutions, and in fact no society has ever existed without a religious element. In all nations, and in Christian nations as well as the rest, there always have been persons who from some cause or other have professed to have no religion, and still more who profess to observe the formalities of religious worship without practising the more weighty duties. But this is no more an argument against the Christian religion than against any other. In Christian nations men may disregard both the precepts and the practice of the Christian religion, but the rule of Christian life still exists, while in the nations where Christianity is not established, though there are both bad and good men, as in Christian nations, there is not the Christian doctrine to appeal to as the sure and infallible rule of life.

REMAINDER. An estate in remainder is defined by Coke to be 'a remnant of an estate in lands or tenements, expectant on a particular estate, created together with the same at one time.' According to this definition, it must be an estate in lands or tenements, including incorporeal hereditaments, as rents and tithes; and it is an estate which at the time of its creation is not an estate in possession, but an estate the enjoyment of which is deferred. The estate in remainder may exist in lands or hereditaments held for an estate of inheritance or for life. It must be created at the same time with the preceding estate, and by the same instrument; but a will and a codicil are for this purpose the same instrument. A remainder may be limited by appointment, which is an execution of a power created by the instrument that creates the particular estate; for the instrument of appointment is legally considered as a part of the original instrument. A remainder may also be created either by deed or by will; and either according to the rules of the common law, or by the operation of the Statute of Uses, which is now the more usual means.

If a man seised in fee simple grants lands to A for years or for life, and then to B and his heirs, B has the remainder in fee, which is a present interest or estate, and he has consequently a present right to the enjoyment of the lands upon the determination of A's estate; or, in other words, he has a vested estate, which is called a vested remainder. A reversion differs from a remainder in several respects. He who grants an estate or estates out of his own estate, retains as his reversion whatever he does not grant; and upon the determination of the estate or estates which he has granted, the land reverts to him.

There may be several remainders and a reversion expectant on them.

The estate which precedes the estate in remainder or in reversion is called the Particular Estate; and the particular estate may be any estate except an estate at will and an estate in fee simple. It must therefore be either an estate for years, or for life, or in tail.

Estates in remainder are either vested or contingent. The remainder may vest at the time of the limitation, or it may vest afterwards: in either case the remainder-man acquires an estate in the land, to the enjoyment of which he is entitled upon the determination of the preceding estate. But it may happen that a vested remainder may never become an estate in possession.

A Vested Remainder is an estate which, by the terms of the original limitation or conveyance, is limited or conveyed unconditionally. If a remainder is not vested, it is contingent or conditional.

A Contingent Remainder is defined by Fearne to be 'a remainder limited so as to depend on an event or condition which may never happen or be performed, or which may not happen or be performed till after the determination of the preceding estate.' Accordingly it is the limitation of the remainder which is conditional, and there is no remainder limited or given until the condition happens or is performed. The uncertainty of the remainder becoming an estate in possession is no part of the notion of a contingent remainder; for this kind of uncertainty may exist, as already observed, in the case of vested remainders.

The subject of contingent remainders, which is merely a special application of the general doctrine of conditions, is fully discussed in the elaborate treatise of Fearne on 'Contingent Remainders and Executory Devises.'

REMAINS, ORGANIC. [Organic Remains.]

REMBRANDT, PAUL GERRETZ, commonly called Rembrandt van Ryn, or Rhyn, was the son of a miller. He was born in 1606, on the banks of the Rhine near Leyden. When very young he was sent to a Latin school at Leyden, but showing a distaste for scholarship, and decided talent for painting, he was placed with Jacob van Zwaanenburg, and subsequently with Peter Lastmann and Jacob Pinas to study that art. After leaving Pinas, he commenced painting with considerable success. In 1630 he settled in Amsterdam, where he resided the remainder of his life, and married a handsome peasant-girl of Ramsdorf, whose portrait he has often painted.

The rapid good fortune which Rembrandt enjoyed from the commencement of his career, appears to have engendered in him a love of money, to gratify which he resorted to various mean expedients. He sold impressions of his etchings before they were finished, when finished, and afterwards with slight alterations. Various other not less mean practices are reported of him. According to Sandrart, Rembrandt realised an annual income of nearly 2500 florins (about 200*l.*) from the sale of the copies made from his works by his pupils (which he passed off as originals, after slightly touching them himself), and the traffic in his etchings alone, independent of the labours of his own pencil and his pupils' fees; a large amount of itself, but which added to the rest must have made a princely income for those times.

Rembrandt's best etchings realise very large prices, both the portraits, which are by far the best of his productions, and the historical subjects. There is a fine collection of his etchings in the British Museum.

Rembrandt had a contempt for the classical. His antiques, as he used to call them, were some old pieces of armour, unique weapons, and curious turbans, with which he indiscriminately clothed individuals of all nations, ancient and modern. At the beginning of his career, he, like most Dutch painters, wrought his works up to a very high finish. The Woman taken in Adultery, in the National Gallery, is probably his best picture in this style. Later in life he bestowed the same labour in order to produce effects of freedom and boldness. To gain this, he is said to have used his palette knife as well as his pencil.

Rembrandt died in Amsterdam, 1674. Paintings by Rembrandt are very valuable. They are scattered all over Europe, and this country possesses many; those in the National Gallery are all fine specimens: the Gallery of Dresden also possesses several of his master-pieces.

REMEMBRANCERS (*rememoratores*), formerly called Clerks of the Remembrance (37 Edw. III., c. 4), are officers of whom, until recently, there were three in the exchequer, called respectively the King's Remembrancer, the Lord Treasurer's Remembrancer, and the Remembrancer of First Fruits; their duty being to put the lord treasurer and the barons of the exchequer, who are the judges of that court, in remembrance of such things as are to be called on and done for the king's benefit.

The Office of the Queen's Remembrancer has relation to the proceedings of the court of exchequer in the exercise of its original jurisdiction as a court of revenue. The queen's remembrancer enters all the recognisances taken before the barons for any of the queen's debts, for appearances, &c., and he takes all bonds for such debts, and for the due execution of offices, and makes out process for breach of them; he also writes process against the collectors of customs, excise, and other public payments, for their accounts. Informations for intrusion into the queen's lands, and information for debts due to the crown, and on penal statutes, are entered and sued in his office; and he makes the bills of composition on penal laws. Indentures and other evidences which relate to the passing of any lands to or from the king are delivered into his office. At the beginning of Michaelmas term he reads in the court the oath taken by all the officers of the court upon admission. Writs of prerogative and writs of privilege for officers and ministers of the court are made out by him; and commissions of Nisi prius, by her Majesty's warrant, on trial of any matters within his office, commissions to find debts due to the crown, and writs of extent awarded in pursuance of 33 Hen.

VIII., c. 39, are issued and prosecuted in this office: also general process for the recovery of arrears of taxes and other debts due to the crown, which issue twice a year. All differences as to irregularities in proceedings are determined by the queen's remembrancer, with power to give costs against the party in fault, but subject to an appeal to the court.

The Lord-Treasurer's Remembrancer's Office was the office principally concerned in matters relating to the landed and casual revenue of the crown. By 3 & 4 Will. IV., c. 99, the office of the lord-treasurer's remembrancer was abolished, and all the offices connected with it. Part of the duties of this office had been previously transferred to other offices, part ceased by the act, and the remainder are performed by the queen's remembrancer.

The Remembrancer of the First Fruits Office receives the bishop's returns of institutions, takes all compositions and bonds for payment of first fruits and tenths, and makes process against all such persons as do not pay the same. (Cowell, 'Report of Select Committee on Finance, 1798.')

Remembrancer of the City of London. The duties of this officer are those of agent for the corporation in parliament, and at the council and treasury boards. He gives a daily attendance at the houses of parliament during every session, to examine all bills and proceedings of the houses of lords and commons, and to report on such as may be likely to affect the interest or privileges of the city.

REMO, SAN. [San Remo.]

REMONSTRANTS. [Pelagianism.]

REMY, ST. [Bouches-du-Rhône.]

RENAISSANCE. The term *Renaissance* indicates the period of the *Revival*, when the classic began to be re-introduced after the mediæval styles, and is often used as synonymous with the term *Cinque-Cento*, which literally means five hundred, whereas it is used as equivalent to mille cinquecento, the *mille* being understood though not expressed, therefore it stands for fifteen hundred, and in its technical sense among artists signifies the style of architecture and general decoration which prevailed during the 16th century, or rather the earlier part of it; nor is it so restricted, for without exact reference to date, it is also applied to what belongs to the style so denoted though it may happen to be *before* the year 1500, which period may be taken as the line of demarcation laid down by the historians of art.

RENAIX. [Flanders, East.]

RENDSBURG, a fortified town of Denmark, in the duchy of Holstein, is situated in 54° 18′ N. lat., 9° 40′ E. long., partly on a heath, partly on an island at the mouth of the Eyder, and at its junction with the Holstein canal. It consists of three parts, the Old Town built on the above-mentioned island, the New Town on the Holstein bank of the river, and the Crown-work, with the last sluice of the canal, and some warehouses, all on the Schleswig side. It has 10,000 inhabitants, including the military. There are two churches, an hospital, a house of correction, a gymnasium, a military academy, a board of trade, and a custom-house. It is the residence of a Lutheran superintendent-general. The place has manufactures of stockings, pottery, tobacco, and vinegar.

At a meeting of the Schleswig-Holstein deputies held in Rendsburg, March 18, 1848, a deputation to the King of Denmark was appointed for the purpose of demanding the convocation of a Schleswig-Holstein Diet, and a constitution for the united duchies. The refusal of the king to grant these demands led to the appointment of a Provisional Government March 24, 1848, of which Rendsburg was the seat.

RÉNÉ OF ANJOU, born in 1409, succeeded his brother Louis III. as Duke of Anjou and Count of Provence, in 1434. After the death of Queen Joanna II., in 1435, Réné laid claim to the kingdom of Sicily and Naples, but he had a powerful rival in Alfonso of Aragon. [Alfonso V.; Joan II.] He was the last of the dynasty of Anjou who sat on the throne of Naples. In 1445 Réné gave his daughter Margaret in marriage to Henry VI. of England, on which occasion he obtained the restoration of his territories of Anjou and Maine, which had fallen into the possession of the English. Réné on the restoration of peace occupied himself with the arts, and wrote several works both in prose and verse; among others one on tournaments, the MS. of which, enriched with drawings, is preserved in the National Library at Paris. In 1449-50, he attended King Charles VII. of France in his successful war against the English. In 1473 Louis XI. of France seized Anjou under some pretence, and Réné retired to Aix in Provence, where he died in 1480. He introduced several useful trees and plants into Provence, among others the muscadel grape, and encouraged manufactures of woollens and glass. Réné was the last representative of the house of Anjou, and after his death Provence was united to France.

RENFREW. [Renfrewshire.]

RENFREWSHIRE, a county of Scotland, is bounded N. by Dumbartonshire, N.E. and E. by Lanarkshire, S. and S.W. by Ayrshire, and W. by the Frith of Clyde. It includes a small portion on the north bank of the Clyde, by which this portion is separated from the rest of the county. Its greatest length, S.E. to N.W., is 32 miles; its greatest breadth, at right angles to the length, is 13 miles. It is included between 55° 40′ and 55° 58′ N. lat., and between 4° 14′ and 4° 54′ W. long. The area is 227 square miles. The population in 1841 was 155,072.

Surface, Geology, Rivers, &c.—The western part of the county, and the southern border which joins Ayrshire, are hilly; the eastern part, especially along the Clyde, is comparatively flat. The hills on the border of Ayrshire are the loftiest. Some of them attain a height of more than 1200 feet.

The south-eastern part of the county is included in the great coal-district of the west of Scotland. The chief coal works are at Quarrelton near Johnstone: and at Hurlet and Househill near Paisley: the mines here are very productive. Limestone, sandstone, ironstone, granite, and secondary trap-rocks are found in considerable

abundance. Good freestone for building is quarried; limestone is also wrought for burning; and the mines of coal and ironstone give employment to many persons.

The whole county is included in the basin of the Clyde, the æstuary of which washes a large portion of the border; but the tributaries which drain it are all small. A stream which bears, in different parts of its course, the names of Rotten Burn, Shaws Burn, and Kipp Water, joins the æstuary of the Clyde at Innerkip on the western side of the county. The central and eastern parts of the county are drained by the Gryfe, which flows from the westward; the Black Cart, which rises in Ayrshire, and unites with the Gryfe about 2 miles N.W. from Paisley; and the White Cart, or the Cart, which rises near the eastern boundary, and passing through Paisley joins the united stream of the Black Cart and the Gryfe just above its entrance into the Clyde near Renfrew. The White Cart is made navigable partly by an artificial cut to the Clyde. Although the other streams are not large enough for navigation, they supply water-power for driving machinery.

The Glasgow, Paisley, and Johnstone Canal extends between Glasgow and Johnstone, 11 miles. The Forth and Cart Junction Canal is a branch from the Forth and Clyde Canal to the Clyde.

A railway extends from Greenock to Paisley, and thus connects Greenock with the Glasgow and Kilmarnock Railway, and a branch connects Renfrew also with Paisley.

Soil and Agriculture.—The hilly parts of the county on the west and south are chiefly devoted to pasture. Scarcely more than half of the whole surface of the county is under cultivation. The cultivated part is on the north and north-east, and in the centre, where the soil is most fertile. The uncultivated districts comprehend black moors or hills, with comparatively extensive bogs in some parts. Owing to the demand for meat, vegetables, milk, butter, &c., by the large and crowded populations of Greenock, Glasgow, and Paisley, a large part of the cultivated land is meadow-land or garden-ground. Dry stone dykes are in use in some parts of the county for fences; but where the soil is better and more under cultivation, hedges are used. Dairy farming is very extensively practised. There are some large estates, and more than half the valued rent is of entailed or corporate property, but property in the rest of the county is a good deal subdivided. Farms are middle-sized, and farm houses and buildings of middling character.

Divisions and Towns.—Renfrewshire contains 16 parishes. The county returns one member to parliament. Paisley and Greenock return one member each; and Renfrew and Port Glasgow unite with Dumbarton, Rutherglen, and Kilmarnock to return another.

The following are the principal towns, with the population of each in 1841:—

Gourock is a small town on the Frith of Clyde, about 3 miles W. by N. from Greenock. Its regular inhabitants are chiefly fishermen; but it is resorted to as a bathing-place. Population, 2169.

Greenock is a burgh of barony, parliamentary borough, and seaport town, situated on the southern shore of the æstuary of the Clyde, 22 miles W. from Glasgow, by the Glasgow, Paisley, and Greenock Railway. There are some handsome buildings in the town, among which are the Town-Hall, built in 1766; the gaol, built in 1810; the Sheriff's Court-House; and the Exchange Buildings. At the beginning of the last century, the harbour, which was then only fit for the reception of fishing boats, was enlarged: more than ten acres were enclosed between two circular quays; and subsequent improvements have rendered the outer harbour available for ships of large burthen. This has been the means of raising the place to an important position as a seaport. The Newfoundland and Nova Scotia fisheries are carried on extensively. On Dec. 31, 1847, the number of vessels belonging to the port was 431, with an aggregate tonnage of 80,444. The borough returns one member to parliament. The corporation consists of a provost, 4 baillies, a treasurer, and 10 councillors. Population of the burgh, 36,135.

Johnstone is 3 miles W. by S. from Paisley, by the Glasgow, Paisley, and Ayr Railway. It is a well-built place, containing cotton mills and some other manufactories. Population of the town, 5824.

Kilbarchan is a mile and a half W. from Johnstone. The houses are mostly of freestone quarried in the neighbourhood. The inhabitants are chiefly engaged in cotton and silk weaving. Population of the village, 2382.

Lochwinnoch is a large village near the western bank of Castle Semple Loch, about 5 miles S.W. from Kilbarchan. The houses are generally of two stories, and slated; cotton-spinning is the chief branch of manufacture. Population of the village, 2681.

Neilston, a village, 5 miles S. from Paisley, contains a population of about 2000. The parish of Neilston contains several other villages; most of the inhabitants, amounting altogether to about 10,000, are employed in various branches of silk and cotton manufactures, the river Lievern affording excellent water-power for driving machinery. There is also abundance of clear water suitable for bleaching.

Paisley. [PAISLEY.]

Pollockshaws is a burgh of barony about 3½ miles S. by W. from Glasgow. It is a tolerably large place, depending almost entirely on the cotton manufacture; spinning, weaving, bleaching, and printing are actively carried on. Population of the town, 5283.

Renfrew, the shire town and a burgh of barony, is 3 miles N.E. by N. from Paisley, by the Paisley and Renfrew Railway. The town is near the south bank of the Clyde, and consists of one main street along the Glasgow and Greenock road, and some smaller streets. The church is a cruciform structure. There are a town-house, gaol, and school-house. The manufactures are various: muslin-weaving is by far the most important. Many females are employed in clipping, tambouring, and flowering. A few small vessels carrying coal,

manure, &c. on the Clyde, belong to the burgh; but a considerable number of vessels, chiefly laden with grain from Ireland, or with dye-stuffs for Paisley, discharge their cargoes here. Potatoes and fish are brought here from the Highlands.

The corporation consists of a provost, two bailies, and 16 councillors. Renfrew is connected with Kilmarnock, Rutherglen, Dumbarton, and Port Glasgow, in returning a member to Parliament. Population of the burgh, 2027.

History and Antiquities.—In the earliest historical period this county seems to have formed part of the territory of the Damnii, who occupied portions of the adjacent counties of Ayr, Lanark, Stirling and Dumbarton. Under the Romans it was comprehended in the province of Valentia. It appears to have been subsequently included in the British kingdom of Strathclyde, and afterwards in the kingdom of Scotland. A large part of it came into the hands of the Stewards of Scotland, progenitors of the Stuart family, by grant from the Scottish kings or by other means, especially Strath-Gryfe, or the valley of the Gryfe. In a later period Renfrewshire made part of the principality formed out of the Stuart domains as an apanage for the eldest sons of the kings of Scotland.

There are some ancient camps in Renfrewshire; and some antiquities, supposed to be druidical, exist in the parishes of Kilbarchan and Lochwinnoch; but they are of little moment. Barr Castle and Elliston Castle, both in Lochwinnoch parish, Peel Castle on Castle Semple Loch, and Newark Castle near Port Glasgow, belong to the middle ages.

RENI, GUIDO. [Guido Reni.]

RENNELL, JAMES, born near Chudleigh in Devonshire, in 1742, entered the navy at an early age as a midshipman. He went with Admiral Parker to India, and rendered some effectual service at the siege of Pondicherry. At the age of twenty-four he quitted the navy, and entered the corps of Engineers in the service of the East India Company. He distinguished himself in the campaigns of Lord Clive, received some severe wounds, and was promoted to a majority. It was during this period that he produced his first work, 'A Chart of the Bank and Currents of Cape Agulhas,' the most southern point of Africa. While he was stationed in Southern India, he surveyed Adam's Bridge and the Paumbeen Passage between the island of Ramisseram and the continent, and he expressed his conviction of the practicability of widening the passage for ships. This suggestion has been acted upon, after a lapse of more than seventy years. While he held the appointment of surveyor-general of Bengal, he published his 'Bengal Atlas,' with an account of the Ganges and the Brahmapootra. On his return to England, in 1782, Major Rennell published a map of Hindustan, accompanied by a Memoir, 4to., 1788. In 1793 he published 'Marches of the British Army in the Peninsula of India during the Campaigns of 1791.' He also published 'Memoir of a Map of the Peninsula of India, exhibiting its Natural and Political Divisions, the latter conformably to the Treaty of Seringapatam, of March 1792;' and also 'Elucidations of African Geography, from the Communications of Major Houghton and Mr. Magra, in 1791, with a Map.' In 1798 he assisted Mungo Park in the arrangement of his African travels, and illustrated his work by a map and a memoir in the appendix. His next work, and that by which he is most generally known, was 'The Geographical System of Herodotus examined and explained,' 4to., 1800. He also wrote:—'Observations on the Topography of the Plain of Troy;' 'A Treatise on the Comparative Geography of Western Asia,' with an Atlas, a work of great labour and research; 'Illustrations, chiefly Geographical, of the History of the Expedition of the Younger Cyrus from Sardis to Babylon, and the Retreat of the Ten Thousand; 'An Investigation of the Currents of the Atlantic Ocean, and of those which prevail between the Indian Ocean and the Atlantic.' For this important work he examined and collated the log-books of all the ships of war and Indiamen which had traversed those seas during the previous thirty or forty years, recomputing their observations and reducing them to one general system. The results of all this prodigious labour were ready for the press at the time of his death, and were shortly afterwards published by his daughter, Lady Rodd. Major Rennell died on the 29th of March, 1830, and was buried in Westminster Abbey. His merits as a patient and judicious critic were of the highest order. His 'Geographical System of Herodotus' is of itself enough to establish a permanent reputation; but this is only one of his many and useful labours.

RENNES, capital of the French department of Ille-et-Vilaine, stands in 48° 6′ 55″ N. lat., 1° 40′ 40″ W. long., on the Ille-et-Rance Canal, at the confluence of the Ille and the Vilaine, and has 37,895 inhabitants. The town occupies the site of the ancient *Condate*, the chief city of the Celtic Redones, whose name it subsequently took, and still bears with slight alteration. On the downfall of the Roman power the Bretons seized Rennes, and formed under their dukes a kind of independent state. In the anarchy which prevailed in Bretagne towards the close of the ninth century, Rennes became the capital of a county till 992, when Count Geoffroi of Rennes assumed the title of Duke of Bretagne; after which event it became again the capital of all Bretagne. In the struggle between De Montfort and De Blois, Rennes, then held by the partisans of De Blois, was besieged for six months by John of Gaunt, but he was obliged to raise the siege. Before the Revolution the States of Bretagne met at Rennes, and it was the seat of a parliament instituted A.D. 1555, by Henri II. In 1720 the town was laid waste by fire, which destroyed the whole of the quarter on the right bank of the Vilaine.

The present town, owing to its pretty situation and the gentle undulation of its site, has an agreeable appearance, especially the part rebuilt since the fire, which is distinguished by wide, regular, and straight streets, handsome squares, and good buildings, constructed of granite. The town is surrounded by an ancient wall and towers. The

upper or new town, and the lower town, which stands on the left bank of the Vilaine, are united by three bridges. The lower town has narrow and crooked streets, with houses mostly built of wood, curiously carved and highly picturesque. The suburbs, which are large, resemble the lower town in character. Rennes is noted for its fine public walks, the principal of which are—Le Thabor, formed out of the gardens of the old Benedictine Abbey; the Mail, which is formed by a long jetty that runs between two canals to the junction of the Ille and the Vilaine, and the Champs-de-Mars, a space of 125 acres, inclosed by raised and shady walks.

The most remarkable of the public buildings are—the cathedral, the churches of St.-Pierre, Toussaint, and St.-Sauveur; the town-house, an elegant modern structure in which are the mayor's offices, a public assembly-room, the public library, lecture-rooms, and schools of design and architecture; the court-house, which is appropriated to the administration of justice and to the study of the law, and is decorated with paintings; the episcopal palace; the abbey of St.-Georges, now occupied as a barrack; the Kergus barracks, and the arsenal.

The manufactures comprehend linen, sail-cloth, flannels, hosiery, lace, cordage, nets, hats, gloves, starch, glue, earthenware, porcelain, candles, and liqueurs. There are tan-yards and wax-bleaching works. A pretty considerable trade is carried on in these articles, and in the honey, wax, poultry, and butter of the surrounding district. The Vilaine is navigated by barges up to the town. [Ille-et-Vilaine.] The Ille-et-Rance Canal communicates with St.-Malo.

Rennes gives title to a bishop. It is the seat of a High Court and University Academy, which have jurisdiction over the departments of Ille-et-Vilaine, Côtes-du-Nord, Finistère, Morbihan, and Loire-Inférieure; and it is the head-quarters of the 15th Military Division. The other institutions of the town comprise tribunals of first instance and of commerce, a national college, a school of law, a secondary school of medicine, an ecclesiastical college, a museum, 4 hospitals, a botanic garden, and public baths.

RENNIE, JOHN, was born on June 7, 1761, at Phantassie in Haddingtonshire, where his father was a farmer. He received instruction in the elementary part of mathematics at Dunbar, and on the promotion of the master, he for a short time conducted the school. He appears to have very early devoted his attention to the subjects of machinery and architecture, and he attended at Edinburgh the lectures given by Dr. Robinson and Dr. Black, on mechanical philosophy and chemistry.

About 1780 he left his native place, and shortly afterwards established himself as a mechanist in London, where he obtained immediate employment. From this period he continued to be occupied in the construction of steam-engines, or of the different kinds of machinery to which, as a first mover, steam is applied; and at the same time he was almost constantly engaged in designing or superintending those public works which have given him so just a claim to celebrity. Between 1799 and 1803 he constructed the stone bridge at Kelso, below the junction of the Tweed and Teviot. He also built stone bridges at Musselburgh and other places in Scotland; but his masterpiece of this kind is the Waterloo Bridge over the Thames. The Southwark Bridge, over the same river, is an iron bridge, and was also constructed by him.

Mr. Rennie superintended the formation of several canals. But his chief work in connection with inland navigation is the Kennet and Avon Canal, which extends from Bath to Newbury. He also gave a plan for draining the fens at Witham in Lincolnshire, which was executed in 1812.

The London Docks and the East and West India Docks at Blackwall are among the great works which are executed from the plans and under the direction or Mr. Rennie. [Dock.] He formed the new docks at Hull (where also he constructed the first dredging-machine used in this country), the Prince's Dock at Liverpool, and those of Dublin, Greenock, and Leith. To these must be added the Breakwater protecting Plymouth Sound from the waves which during high winds used to roll in with tremendous force. Mr. Rennie also gave plans for improving the harbours of Berwick, Newhaven, and other places, and the dockyards of Portsmouth, Plymouth, Pembroke, and Chatham: he also built the pier at Holyhead.

Before his death he had given plans for improving the docks at Sheerness; which have since been executed by his first and second sons, Messrs. George and John (now Sir John) Rennie. To Sir John Rennie was also confided the charge of the construction of the present London Bridge, from the design of his father.

Mr. Rennie died of an inflammation of the liver, Oct. 16, 1821, and was buried in St. Paul's Cathedral.

RENT is defined by Mr. Ricardo to be 'that portion of the produce of the earth which is paid to the landlord for the use of the indestructible powers of the soil. It is often however (he remarks) confounded with the interest and profit of capital, and in popular language the term is applied to whatever is annually paid by a farmer to his landlord.' Mr. Malthus ('Prin. of Pol. Econ.') defines rent to be 'that portion of the value of the whole produce which remains to the owner of the land, after all the outgoings belonging to its cultivation, of whatever kind, have been paid, including the profits of the capital employed, estimated according to the usual and ordinary rate of the profits of agricultural capital, at the time being.'

The chapter on rent, in the 'Wealth of Nations,' though abounding in important facts, contains no distinct enunciation of the nature and causes of rent. Dr. James Anderson, in the 'Recreations in Agriculture' (vol. v., p. 401), published in 1801, propounded the theory of the origin and progressive increase of rent which has been generally recognised; but his theory excited little attention at the time; and it was not until 1815 that it was more fully and elaborately treated in

two works published simultaneously: one of them was an 'Essay on the Application of Capital to Land,' by a Fellow of University College, Oxford (Mr. West, a barrister, afterwards chief-justice of Bombay); the other work was by the late Mr. Malthus, and was entitled 'An Inquiry into the Nature and Progress of Rent.' The late Mr. Ricardo had adopted the principles of these two works several years before they were published, but it was not until 1817 that a pamphlet by him appeared which contained his views on the subject. The publication of his 'Principles of Political Economy and Taxation' followed in the same year. Mr. Mill and Mr. MacCulloch have more fully adopted the Ricardo theory than any other writers; but Mr. Malthus has dissented from some of its principles, although his views in the main coincide with that theory; and Professor Tucker, of the university of Virginia, dissents from it still more widely than Mr. Malthus.

As most modern economists have adopted the main principles of the Ricardo theory, we here give an outline of it, in the words of Mr. Ricardo.

Mr. Ricardo says:—'If all land had the same properties, if it were boundless in quantity and uniform in quality, no charge could be made for its use, unless where it possessed peculiar advantages of situation. It is then because land is of different qualities with respect to its productive powers, and because, in the progress of population, land of an inferior quality, or less advantageously situated, is called into cultivation, that rent is ever paid for the use of it. When, in the progress of society, land of the second degree of fertility is taken into cultivation, rent immediately commences on that of the first quality, and the amount of that rent will depend on the difference in the quality of these two portions of land. . . With every step in the progress of population which shall oblige a country to have recourse to land of a worse quality to enable it to raise its supply of food, rent on all the more fertile land will rise. . . . If good land existed in a quantity much more abundant than the production of food for an increasing population required, or if capital could be indefinitely employed without a diminished return on the old land, there could be no rise of rent; for rent invariably proceeds from the employment of an additional quantity of labour with a proportionally less return.' The examination of this theory would require much space; and, though it cannot be entirely rejected, it is open to objections which have been made to it by Professor Tucker and others.

RENT (in Law Latin, *redditus*, 'a return,') is a right to the periodical receipt of money or something valuable in respect of lands or tenements held by him from whom the rent is due. There are three kinds of rent—Rent-Service, Rent-Charge, and Rent-Seck.

It is Rent-Service when a tenant holds lands of his lord by fealty and certain rent, or by homage, fealty, and certain rent, or by other services and certain rent. Rent-service therefore implies tenure, and it may be due to the lord of the manor of which the lands are held, or to some other chief (that is, immediate) lord of the fee, or to the reversioner. The right of distress is an incident to rent-service in arrear so long as it is due to the same person to whom fealty is due. In order that rent-service may now be created, the person to whom the rent is reserved must have a reversion in the lands and tenements out of which the rent is to issue; but any reversion is sufficient. Thus a person who has a term of twenty years may grant it to another, all but one day, and this will leave him a reversion, so that a rent-service may be reserved, with its incidents of fealty and the right of distress. If he assign all his term, reserving a rent, but without a clause of distress in the assignment, he cannot distrain for the rent.

Rent-service therefore which has been created since the statute of Quia Emptores can only be reserved to the lessor who retains a reversion, and it will belong to the person who is entitled to the reversion. A rent-service reserved out of chattels real belongs to the personal representatives of the lessor. A rent is now most commonly reserved in leases for years, but it may be reserved on any conveyance which passes or enlarges an estate.

A rent-service may be separated from the reversion or seignory, by the reversioner granting the rent and retaining the fealty: in this case the lands are still held of the grantor, but the rent is due to the grantee; not however as rent-service, but as rent-seck (redditus siccus), so called 'for that no distress is incident to it.' (Litt. 218.) If the seignory or reversion is granted, the rent-service will pass by the grant, and the grantee is entitled to receive the rent from the tenant from the time that he gives him notice of the grant, together with all rent that had accrued due since the grant, and is unpaid at the time of such notice.

Rent-service can only be reserved to the feoffor, donor, or lessor, or to their heirs, upon any feoffment, gift, or lease; and if rent is reserved generally, without specifying the persons, it will belong to the lessor, and after his death to those who are entitled to the reversion. Rent is payable at the times mentioned in the reservation, but not till the last minute of the day on which it is payable.

By the common law the lessor has also an action of debt for rent against a lessee for years or at will; and by the statute of 8 Anne, c. 14, s. 4, there is also the same action against a lessee for life during the continuance of his estate, which had previously been given for arrears of rent after the determination of the estate (32 Hen. VIII. c. 37). A lessor may also have an action of covenant for rent, either by force of the implication contained in such words as 'yielding and paying' rent, or by force of an express covenant to pay, which is seldom omitted in any lease. If the lessee assign his interest in the term, he, and his executors so far as they have assets, are still liable under the covenants to the person entitled to the reversion. The assignee also becomes bound by such of the covenants as run with the land, and is consequently liable to an action upon them. There is also the remedy by action of assumpsit or debt for the use and occupation of land, which

action lies without any express agreement for rent.

A Rent-Charge is a rent granted out of land either at common law or by the Statutes of Uses, with a power of distress for the recovery of the rent. Such rents may be created by the owner of the land who retains the property of it; and they may also be reserved on the alienation of the land. These rents differ from rent-service in not being connected with tenure, and the remedy by distress is therefore not an incident to rent-charges, but is created by the same instrument which creates the rent-charge. If no power of distress is given, the rent is a rent-seck. Rent-charge may be created either by deed or by will.

An estate in a rent-charge may be either in fee simple, in fee tail, for lives, or for years, according to the terms of the original limitation. A rent-charge of inheritance is real estate, and descendible to the heir; but a payment that is due belongs to the person representative.

A Rent-Seck, as already mentioned, is not accompanied with a right to distrain at common law; but by the stat. 4 Geo. II. c. 28, s. 5, this distinction in respect of remedy between rent-service and rent-seck, created since that statute, is abolished.

A Fee-Farm Rent is properly a perpetual rent-service reserved by the crown, or, before the statute of Quia Emptores, by a subject, upon a grant in fee simple. The purchaser of fee-farm rents originally reserved to the crown, but sold under 22 Car. II. c. 6, has the same power of distress that the king had, and so may distrain on other land of the tenant not subject to the rent.

REOLE, LA. [GIRONDE.]

REPETEND, the part of a circulating decimal which is perpetually repeated.

REPLEVIN. The only form of replevin now in use is replevin of goods, called in the old statutes Replegiari de Averiis, cattle (in law Latin, *averia*) being the species of goods which usually formed the subject of a distress.

If the goods of a party were taken out of his possession against his will, he was entitled at common law to sue out a writ of Replegiari Facias, by which the sheriff of the county in which the goods were taken, or of the county in which they were detained, was required to cause the goods to be replevied, *i.e.*, restored, to the owner upon his giving pledges for the prosecution of his action, and also by statute pledges for the return of the goods to the distrainor in case a return should be adjudged. As the right of the party from whom the goods are taken to have the possession restored to him by replevin depends upon the property belonging to him, if the taker of the goods claim them as his own property, the power of the sheriff is suspended, until the party has sued out a writ De Proprietate Probandâ, by which the sheriff is directed to summon a jury for the purpose of trying whether the goods are the property of the plaintiff or of the defendant; and if they are found to be the property of the plaintiff, then to replevy them; if of the defendant, the plaintiff's claim to be restored to the possession of the goods remains in suspense until the termination of the action. A special action lies at the suit of the crown and the party aggrieved, for falsely claiming property in the goods distrained, and thereby preventing a replevin.

A replevin does not lie for goods taken in execution, or for goods seized for a debt to the crown.

Replevin lies notwithstanding an express agreement that the landlord shall be at liberty to distrain and hold the goods against pledges (that is, notwithstanding a tender of pledges) until the rent be paid.

Executors may maintain replevin for the goods of the testator taken in his lifetime, and a husband may bring replevin alone, without naming his wife, for the goods of the wife taken before the marriage; for the property in the goods passes to the executors, and to the husband respectively, notwithstanding the seizure and detention.

A person may in some cases support a replevin without being the owner of the goods, as where the plaintiff is the bailee of the goods taken.

In the time of Henry III., it was provided by the statute of Marlbridge, passed in 1267, that if the cattle of any person be unjustly taken and detained, the sheriff, after complaint made to him thereof, may deliver them without hindrance or refusal of him who took the cattle. In 1554, with a view of making the delivery of distresses more expeditious, it was enacted by 1 & 2 Philip and Mary, c. 12, s. 3, 'That every sheriff of shires, being no cities nor towns made shires, shall at his first county-day, or within two months next after he hath received his patent of his office of sheriffwick, depute, appoint, and proclaim, in the shire-town within his bailiwick, four deputies at the least, dwelling not above 12 miles distant from one another; which deputies so appointed and proclaimed shall have authority in the sheriff's name to make replevies and deliverance of such distresses, in such manner and form as the sheriff may and ought to do.' The proceeding by writ of replevin does not seem to be affected by the Uniformity of Process Act (2 Will. IV., c. 39, s. 21), which directs that the writs mentioned in that act shall be the only writs for the commencement of personal actions in the cases to which such writs are applicable, inasmuch as none of these writs are capable of being applied to the objects to be accomplished by the writ of replevin.

In numerous inferior courts jurisdiction is possessed, under charters from the crown, to hold pleas of replevin by plaint. By an act passed in 1284 (Westm. 2, c. 2), the sheriff is required, before he make deliverance of the distress, to take from the plaintiff pledges not only for the prosecution of the suit, but also for returning the cattle in the event of a return being adjudged. This statute is silent as to the amount in which security should be taken. For the purpose of fixing the extent of the responsibility of the pledges and of preventing vexatious replevins in cases of distress for rent, it was enacted in 1737 (by 11 Geo. II., c. 19, s. 23), that sheriffs and other officers having authority to grant replevin shall in every replevin of a distress for rent, take, in their own names, and before any deliverance is

made of the distress, from the plaintiff and two responsible persons as sureties, a bond in double the value of the goods distrained (such value to be ascertained by the oath of one or more credible witness or witnesses not interested in the goods or distress, such oath to be administered by the person granting such replevin), with a condition for prosecuting the suit with effect and without delay, and for duly returning the goods and chattels distrained in case of a return being awarded.

By this latter statute the sheriff or other officer granting the replevin is authorised to assign the replevin bond to the avowant (the party who took the distress in his own right), or to the person making cognisance (the party acknowledging the taking of the distress on behalf of some other person, and as his bailiff, for the term applied to any person undertaking this species of agency, the duty of taking distresses having been formerly part of the ordinary duties of the bailiffs of manors); and the assignee of the bond is thereby empowered to sue upon it in the superior courts, in the event of the condition of the bond not being performed.

If upon issue joined, in the Court of Common Pleas, a verdict is found for the plaintiff, the jury usually assess the damages; but if they omit to do so, a writ of inquiry issues to assess damages for the taking and detention, and also for the value of the goods, if it appear either by the pleading or by a suggestion by the plaintiff on the roll that the goods have perished or are still detained. But when the taking was lawful, and the detention only wrongful, no damages are given for the taking, as where goods are distrained damage feasant (wrongfully encumbering the defendant's property) and are impounded after tender of sufficient amends. Upon a judgment for the plaintiff on demurrer, a writ of inquiry issues to assess the damages, framed, as in other cases, with reference to the state of the record. Where there is judgment for the defendant upon verdict or demurrer, or the plaintiff is nonsuited, the judgment directs that the defendant shall have the goods restored to him without being again subject to being replevied, which is called a return irreplevisable; and, by 17 Car. II., c. 7, on distress for rent, if the plaintiff in replevin by plaint, or writ depending in any court at Westminster, be nonsuited before issue joined, the defendant making a suggestion in nature of an avowry or cognisance for such rent, the court is directed, upon his prayer, to award a writ to inquire what rent is in arrear, and the value of the goods and cattle distrained; and on the return of the inquisition the defendant is to have judgment to recover the arrears of rent, if the goods, &c., distrained amount to that value, otherwise to the value of the distress, with full costs; and if the plaintiff be nonsuited after avowry or cognisance, and issue joined, or a verdict be for the defendant, the jury are to inquire the amount of rent in arrear, and the value of the distress; and if judgment be for the defendant on demurrer, the court is to award a writ to inquire the value of the distress, and the defendant is to have judgment for the arrears mentioned in the avowry or cognisance, if the distress amount to so much, otherwise to the value of the distress, and his costs.

REPLICATION. [Pleading.]

REPORTS (in Law) are relations of the proceedings of courts of law and equity. They contain a statement of the pleadings, the facts, the arguments of counsel, and the judgment of the court in each case reported. The object of them is to establish the law, and prevent conflicting decisions, by preserving and publishing the judgment of the court, and the grounds upon which it decided the question of law arising in the case.

The earliest reports extant are the 'Year-Books,' which commence, and are now printed, from the reign of Edward II., with occasional interruptions in the series, down to the reign of Henry VIII. The Year-Books are wholly written in Norman-French, although by 36 Edw. III. stat. 1, c. 15, it was enacted that all pleadings should be in the English language, and the entries on the rolls in Latin. The Norman-French continued to be used by some reporters even as late as the 18th century. The place of the Year-Books was supplied by Reports compiled and published by private individuals on their own responsibility, but subject for some time to the inspection and approbation of the judges, whose testimony to the ability and fitness of the reporter is often prefixed to the Reports. This however soon became a mere form, as appears by the statement of Lord Keeper North, who speaks slightingly of the Reports in his time as compared with his favourite Year-Books.

The English language was first used by reporters about the time of Elizabeth. Lord Coke employed it in his 'Commentary upon Littleton.' From the period of Elizabeth down to the present, Reports have been published of the proceedings in all the courts. The whole body of Reports is now very large. Every court has its reporters, who are not persons authorised by the courts. The reporters use their own judgment as to what they shall report, and their volumes often contain trifling matters and are swelled out to a most unreasonable and useless bulk.

A good record of cases decided, with a brief statement of the cases and the grounds of the decision, is useful and necessary; but the great mass of reported cases and the trifling matter of many of them have had the effect of making lawyers rely more on the judgments in particular cases than on those general principles of law which have an extensive application and are the surest foundation for a sound legal opinion.

REPRIEVE (from the French *repris*, withdrawn) means the withdrawal of a prisoner from the execution and proceeding of the law for a certain time. Every court which has power to award execution, has also power, either before or after judgment, to grant a reprieve. The consequence of a reprieve is, that the delivery or the execution of the sentence of the court is suspended. A reprieve may proceed from the mere pleasure of the crown expressed to the court, or from the discretion of the court itself.

There are two cases in which a reprieve is

always granted. One is where a woman who has been capitally convicted pleads her pregnancy in delay of execution. The other is where a prisoner appears to have become insane between judgment and the award of execution. In such case a jury must be sworn to inquire whether he really is insane. If they find that he is, a reprieve must be granted.

REPTILES, *Reptilia*. Strictly speaking, the word *Reptile* applies to any creature that creeps upon the ground; but in a zoological sense it is restricted to a large group or class of cold-blooded vertebrate animals, normally oviparous, some covered with horny plates, shells, scales, or granulations, while others have the skin entirely naked. As examples we may adduce Tortoises, Crocodiles, Lizards, Snakes, Toads, and Frogs, the Siren, the Axolotl, &c. This branch of zoological science is termed *Herpetology* (ἕρπω, *Herpô*, to crawl or creep).

Some authors divide Reptiles into two classes, viz. *Reptilia* and *Amphibia*, including under the latter Toads, Frogs, the Siren, the Axolotl, &c. The class *Amphibia* they divide into two sections, viz. *Caducibranchiate* (Toads, Frogs, &c.), and *Perennibranchiate* (Siren, Axolotl, Proteus, &c.). An order they undoubtedly constitute, though, in our opinion, not a class. See Bell's 'History of British Reptiles,' in which the reasons for their arrangement into a class, according to the ideas of that skilful zoologist, are fairly expounded.

It is to Ray that we owe the first arrangement of reptiles which has any claim to be termed scientific; then follows Linnæus; but Laurenti was the first to produce a well-digested history of this class, with the exception of the Tortoises, which he omits. ('Specimen Medicum exhibens Synopsin Reptilium,' &c., Vienna, 1768, 8vo.)

Scopoli, in his 'Introduction to Natural History' (1777), devotes a few pages, not unworthy of perusal, to Reptiles. The Count Lacépède next claims our notice as a writer on this branch of zoology (1788-1790); and to him suceeeds M. Alexandre Bronguiart, whose memoir was read in 1799 to the French Academy of Sciences, and afterwards published in the 'Bulletin des Sciences,' in 1800.

In 1801 M. Latreille published his 'Natural History of Reptiles,' and in 1825, in his 'Families of the Animal Kingdom,' proposed a new arrangement. In 1802 and 1803 appeared the 'Traité Général' of Daudin.

As writers on this subject we may also mention Oppel, Cuvier ('Règne Animal'), Merrem ('Materials for a Natural History of Amphibia'), M. de Blainville ('Nouveau Bulletin des Sciences de la Societé Philomatique,' 1816.)

In 1825 Mr. John Edw. Gray published his 'Synopsis of the Genera of Reptiles and Amphibia,' in the 'Annals of Philosophy.' This paper the student ought to consult, as it is replete with information, and presents an admirable arrangement. He considers the reptiles as consisting of two classes, namely *Loricata* and *Amphibia*. The class *Loricata* contains the following orders: — 1, *Emydosauri* (Crocodiles, Ichthyosaurus, Plesiosaurus); 2, *Sauri* (Geckos, Lizards, Chamelions); 3, *Saurophidii* (Scincks, Blind-Worm, Amphisbæna, &c.); 4, *Ophidii* (Serpents); 5, *Chelonii* (Tortoises, Turtles, &c.). Under the class *Amphibia* the following orders are arranged:—1, *Anoura* (Frogs, Tree-Frogs, Toads, &c.); 2, *Urodela* (Salamander, Newt, &c.); 3, *Sirenes* (Proteus, Siren, Amphiuma); 4, *Apoda* (Cæcilia).

In 1831 the same author published, in Griffith's Cuvier (vol. ix.), a 'Synopsis of the Species of Reptiles,' in which he made some alterations in his first classification. He there places the order *Testudinata* in the first section (*Cataphracta*), and distributes the genera nearly in the same manner adopted by him in his separate publication, 'Synopsis Reptilium,' where he particularly treats of the *Chelonians*. In the second section (*Squamata*) he arranges the Saurians, Ophisaurians, and Serpents.

In the 'Synopsis of the Contents of the British Museum' (1840), Mr. Gray has again considerably modified his method, and, as we think, improved it. The *Reptilia*, forming the third class, are arranged under the following orders:— 1, *Sauria*; 2, *Ophidia*; 3, *Chelonia*; 4, *Emydosauri*; 5, *Amphisbænia*.

Among numerous writers on Herpetology, one work requires to be particularly mentioned as indispensable to the student, the 'Erpétologie Générale,' by MM. Duméril and Bibron, forming part of the 'Suites à Buffon,' in which the structure, senses, general history, and classification of Reptiles are treated in a masterly style, and in which the reader will find a review of the labours of every preceding author in this department of zoology. This work is in fact a library of Herpetology, and is illustrated by most accurate and well-executed engravings.

[Amphibia; Amphisbæna; Amphiuma; Axolotl; Frogs; Gecko; Blind-Worm; Boa; Lacertiadæ; Chameleons; Monitor; Crocodile; Alligator; Anolis; Dragon; Ichthyosaurus; Plesiosaurus; Iguanidæ; Iguanodon; Salamandridæ; Serpents.]

Fossil Reptiles.—Of all the animals which the wrecks of a former world contain, none exhibit more striking more gigantic proportions than the fossil Reptiles. [Ichthyosaurus; Iguanodon; Megalosaurus; Plesiosaurus; Pterodactyle; &c.] We may here also remark, that there is reason for believing that Batrachians of gigantic dimensions once inhabited our planet.

REPTON, HUMPHRY, was born at Bury St. Edmund's, where his father was Collector of Excise, May 2, 1752. After having been educated at the grammar-schools of Bury and Norwich, he was sent to Gorkum in Holland, in the summer of 1764, to be initiated into business. At the age of 16 he returned to England, and at the age of 21 he married, and was established by his father in business as a merchant. But mercantile pursuits proving as unprofitable as they were uncongenial to him, he retired, about 1784, to Harestreet, in Essex, where, after considering various means by which he might relieve himself from his embarrassments, and provide for an increasing family, he announced to his friends his inten-

tion of practising as a 'landscape gardener.' In this profession he was exceedingly successful, and was consulted by the owners of estates and mansions in almost every part of the kingdom. In the midst of avocations both profitable and peculiarly suited to his taste he lived until March 24, 1818, when he died suddenly from an injury of the spine occasioned by the upsetting of his carriage in 1811.

His professional publications consist of 'Sketches and Hints on Landscape Gardening,' 4to., 1795; 'Observations on the Theory and Practice of Landscape Gardening,' 4to, 1803; 'Inquiry into the Changes of Taste in Landscape Gardening,' 8vo, 1806; 'Fragments on the Theory, &c., of Landscape Gardening,' 4to, 1816, &c. His works were reprinted in 1840 by the late Mr. Loudon.

REPUBLIC is derived immediately from the French *république*, and ultimately from the Latin *res publica*. The Latin expression *res publica* corresponds very closely with the English word *commonwealth* as used in its largest acceptation for a political society. The Latin word *respublica* might be applied to a community under a substantially monarchical government; for instance, it was so applied to Rome under Augustus. The word however was more applicable to a society with a popular government than to a society with a monarchical government.

A *republic*, according to the modern usage of the word, signifies a political community which is not under monarchical government, or, in other words, a political community in which one person does not possess the entire sovereign power. The word *republic* is sometimes understood to be equivalent to *democracy*, and the word *republican* is considered as equivalent to *democrat;* but this restricted sense of the words is inaccurate; for aristocratic communities, such as Sparta, Rome in early times, and Venice, have always been called republics.

REPULSION is that power by which bodies or the particles of bodies are made to recede from one another. Both attraction and repulsion exist in all the particles of material substances, and seem to be properties by which those particles act upon one another when not in contact. The cause of these actions will probably be for ever unknown to us, and the terms are only applied in conformity to the phenomena exhibited. At all sensible distances, bodies, small and great, except in certain states with respect to electricity or magnetism, attract one another; and the intensity of the attraction varies inversely as the square of the distance between the bodies. But the phenomena of light and of elasticity in general show that at distances which are not appreciable by the eye (perhaps such as are less than $\frac{1}{2000}$ of an inch) both attractions and repulsions take place.

From the phenomena of diffraction [DIFFRACTION] Newton was led to the opinion that all material bodies might be assemblages of particles in equilibrio between their mutual attractions and repulsions. He imagined also that a subtle æther, pervading material bodies, was the immediate agent in producing such attractions or repulsions, together with all the circumstances of cohesion, and also those of chemical, magnetical, and electrical actions.

The reality of a distance between the particles of bodies, whether solid, fluid, or gaseous, admits of no question; for the differences in the densities of these classes of bodies, as well as the different contractions of the bodies in the process of cooling, can only be conceived to arise from the different extent of the intervals between the particles. The Newtonian experiment of pressing a convex lens of glass upon the surface of a glass mirror affords evidence that the lens, at the point of nearest approach, and under a very great pressure, is not in contact with the mirror; and it seems to follow that a vast force of repulsion must be in action between the particles of bodies when they are as near together as mechanical power can bring them. It is right however to observe, that the word repulsion is often applied to phenomena which are in reality the results of attraction. For example, a small quantity of quicksilver being laid on a glass plate assumes a spherical form, instead of spreading over it a thin surface; and this was once supposed to arise from a repulsive power in the glass, whereas it is owing to the attraction of the particles of quicksilver for one another being greater than the attraction of the glass for the quicksilver.

The expansions of solids and fluids by heat, and the elastic powers of gas at different temperatures, are consequences of the repulsions residing in the particles of caloric, or induced by the latter in those of the bodies with which they are combined. The repulsive power existing in the air which is condensed in nitre, produces, on being combined with heat, a velocity of expansion equal to about 7000 feet per second; and the force of pressure resulting from it is thought to be equal to 2000 times the pressure of the atmosphere. (Hutton, 'Tracts.') The repulsive force which produces some of the electric explosions in the atmosphere is supposed to be much greater. But the forces both of attraction and repulsion by which the particles of light are deflected from their course when they impinge on a refracting or reflecting surface are enormous; and Sir John Herschel computes that they exceed the force of gravity in the ratio of 2×10^{44} to 1.

REQUEÑA. [CASTILLA-LA-NUEVA.]

REQUEST, COURTS OF (sometimes called *Courts of Conscience*), were local tribunals, founded by act of parliament to facilitate the recovery of small debts from any inhabitant or trader in the district defined by the act. These courts have been superseded by the County Courts' Act, 9 & 10 Vict. c. 95.

RE'QUIEM (*Requies*, Lat., *rest*), the name of a Mass sung in the Romish Church for the repose of the dead, beginning *Requiem æternam*, and in the Roman Catholic liturgy called *Missa pro Defunctis*.

RESCUE, in Law ('rescous,' from the old French word *rescourser*, 'to recover'), is the unlawful and forcible setting at liberty a person or goods then in lawful custody. A rescue may be

either a criminal offence or a civil injury, according to the circumstances under which it is effected. The character of the criminal offence is determined by the character of the offence committed by the person rescued. If, for instance, a party has rescued a traitor or a felon, he has committed the offence of treason or felony. A rescue committed under other circumstances is a misdemeanor. An indictment for a rescue must set out the circumstances under which the person, &c., was arrested, and the rescue effected, so as to show that all things existed necessary both in fact and intention to create the offence of rescue, and to enable the offender to disprove them.

Such was the state of the common law on this subject. Many statutes have been passed, some very limited in their application, which do not materially vary the character of the offence, the proceedings, or the punishment. Of these the most important and general in their application are 25 Geo. II., c. 37, relating to the rescue of a person convicted of murder, or his body after execution; 1 & 2 Geo. IV., c. 88, which applies to persons rescuing or assisting to rescue from the lawful custody of any constable or other person whatsoever any person charged with or suspected of or committed for any felony, or on suspicion thereof; and 5 Geo. IV., c. 84, relating to the rescue of prisoners sentenced to transportation.

By the 2 Will. & Mary, st. 1, c. 5, upon rescue of goods distrained for rent, the person grieved may by action on the case recover treble damages and costs against the offenders or any of them, or the owner of the goods, if found to have come to his use or possession.

RESEDA'CEÆ, a natural order of plants belonging to the class of Exogens. The species of this order are soft herbaceous plants, or in a few instances small shrubs with alternate entire or pinnately divided leaves, and minute gland-like stipules. The flowers are in racemes or spikes. They are natives of Europe, the adjoining parts of Asia, the basin of the Mediterranean, and the adjacent islands. A few species occur in the north of India, the Cape of Good Hope, and California.

None of the species possess very active properties. *Reseda luteola* is the Woad, or Weld, that is used in dyeing. *R. odorata* is the common Mignonette. It is a native of the North of Africa and Egypt, but its delicious fragrance has caused it to be cultivated all over the world. It is naturally an herb, but when trained in the greenhouse it becomes shrubby. This plant is in great demand in the London markets, and is very extensively cultivated. The seeds should be sown in pots or transplanted into pots, 4 or 6 plants to a pot 4 inches in diameter.

The arborescent plant called Tree-Mignonette may be propagated by seeds or by cuttings, which readily strike root. The young plants should be potted singly, and brought forward by heat. As they grow they should be tied to a stick, and all side-shoots should be pinched off. As the plants attain a greater size they should be shifted progressively into larger pots.

RESHT. [PERSIA.]

RESIDUAL PHENOMENON, a term lately brought into partial use, to signify that part of a phenomenon which is left, when every part which can be explained or accounted for is removed. This residual phenomenon may be all the observer's error, or may be partly the effect of some undiscovered law and partly the error of the observer.

RESIGNATION. The word Resignation literally signifies an unsealing or breaking of a seal in order to open a testamentary instrument. The English word Resignation is the proper term to express the giving up of a benefice, which the canonists call Renunciation. A Surrender is the giving up of temporal land into the hands of the lord.

The term Resignation is now generally applied to any giving up of an office or place, even to those which are merely honorary. It is usual to accept such resignations formally, though in most cases a man may give up or withdraw from any such place when he pleases, though he will not thereby alone free himself from any pecuniary demand to which he may in such capacity have made himself liable.

RESINS are secretions of plants, which are probably all in a fluid state, but become solid either by the evaporation of their more volatile parts, or by the absorption of oxygen. They are distinguished from true Balsams by the absence of benzoic acid, and from Gum-Resins by the absence of gum, their complete insolubility in water, and their requiring alcohol for perfect solution. Some are soluble in cold alcohol, and these are termed *resins;* others are soluble only in boiling alcohol, and termed *sub-resins;* but the two are often also associated in the same substance. Many volatile oils, by long exposure to the air, or merely by a reduction of temperature, deposit a substance termed *stearopten,* which is analogous to resin. Where a considerable quantity of volatile oil co-exists with a resin, a honey-like consistence is preserved, and the resin is termed *soft-resin.* When a very large portion of oil is present, a fluid condition exists, and *turpentine* is the proper designation.

Taken internally, resins are stimulants, promoting secretion of the skin and kidneys; externally, they are rubefacient. Some resins are dangerously caustic, such as Euphorbium.

RESISTANCE is a power by which motion, or a tendency to motion, in any body is impeded or prevented. When a weight or pressure acts upon a beam or bar in any direction, the tenacity by which the particles of such material oppose that action constitutes a resistance of one kind. [MATERIALS, STRENGTH OF.] Again, when a body is made to move on another, the inequalities of the surfaces of both create a resistance of a different kind. [FRICTION.] When a body moves in a fluid, the inertia of the fluid particles displaced by it produces a third kind of resistance.

This last branch of the subject of resistances has already been in part considered. [HYDRODYNAMICS.] In that article there is given a general expression for the measure of the resistance made by a fluid against a plane surface which is either perpendicular or inclined to the direction of the

motion, together with a few results of experiments on the resistances experienced by bodies of various forms and lengths in moving through water. For the pressure against a cannon-ball moving in air, see GUNNERY.

In investigating the resistance of fluids against bodies moving in them, it is supposed that the particles on being struck are repelled perpendicularly to the front of the moving body; but, in fact, the particles of the fluid are in part repelled from the front in oblique directions, and, on account of the compressed state of the surrounding fluid, these particles not being able immediately to escape laterally, there is produced in front more or less condensation, and consequently an increase of resistance. The pressure of the fluid against the sides of the moving body creates also a resistance from friction; and when the velocity is very great, the fluid not falling towards the hinder part of the body so fast as the latter moves, the pressure there which would serve to counterbalance the resistance in front, is in part or wholly removed. On these accounts it is that military projectiles are subject to such vast retarding forces. It is computed that a 24-pounder ball experiences a resistance equal to 800 lbs. when its velocity is equal to 2000 feet per second. Like effects take place in the movement of boats or ships; when the velocity is great, the water accumulates in front, and flowing off from thence obliquely, it carries away some from the sides, and, causing the surface of that which is near the stern to be rather lower than the general level, it there produces a diminution of pressure, while there is an excess in front on account of the accumulation.

In M. de Pambour's 'Practical Treatise on Locomotive Engines,' there is given an account of some experiments in which a number of waggons, both singly and in trains, were made, by gravity, to run down a double-inclined plane; and these, since the motions were not produced by steam or any power which is liable to irregularity, appear to be the most convenient for obtaining separately the effects of friction and the resistance of the air. From these it was found that the friction is equivalent to $\frac{1}{465}$ of the whole weight of the train, and that the resistance of the air, the velocity being 17.6 feet per second, or about 12 miles per hour, was $\frac{1}{847}$ of the weight; this last varies of course with the square of the velocity.

From the experiments of Mr. Telford, the following values of the resistances experienced by loaded carriages on level roads have been determined. On a good pavement the resistance is $\frac{1}{70}$ of the weight of the carriage and load; on a broken surface of old flint, $\frac{1}{35}$; on gravel, $\frac{1}{15}$; and on a well-constructed railway, from $\frac{1}{300}$ to $\frac{1}{250}$.

By experiments made on the force (of traction) required to give motions to vessels on canals, it is found that the resistance varies nearly as the cube of the velocity; and this great deviation from the general law of resistances is probably caused by the reaction of the sides of the canal against the water displaced by the vessel. It deserves however to be mentioned, that when the velocity of the vessel is considerable, the resistance has been found to experience some diminution, perhaps on account of the water momentarily displaced, from its inability to escape laterally, becoming condensed, and thus giving superior buoyancy to the vessel; the immersed part being less, the pressure of the water against the front will also be less.

Mr. Barlow observes that, with small velocities, the force of traction on canals is less than on railways; and when the velocity is equal to four miles per hour, the forces are equal. Beyond this velocity the advantage is in favour of the railway.

RESOLUTION. The resolution and *Solution* of a question are, in common language, the same things. The word is also used as opposed to *Composition*.

RESPIRATION, or the process of breathing, is that by which changes are effected in the common nutritive fluid of the body by its being brought into contact with the atmospheric air.

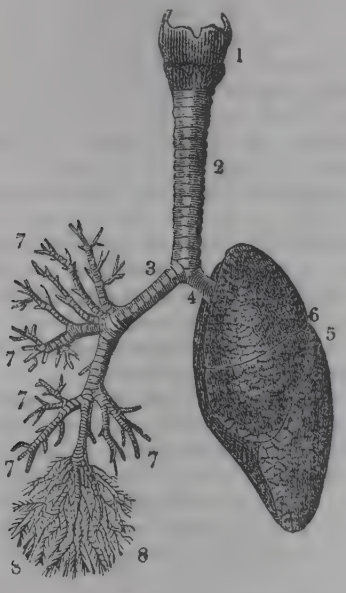
The atmosphere is composed of two gases—nitrogen and oxygen; but the latter is the only gas by which respiration is supported. Pure oxygen however is not fit for breathing; it destroys life after a few hours, and an animal placed in it dies before it is all replaced by carbonic acid. The nitrogen of the atmosphere dilutes the oxygen to the degree which appears the best suited for respiration; and as the former gas has not its quantity materially altered by being breathed, it is probable that this dilution is the only purpose which it serves in relation to the present function.

There are three chief forms of organs for respiration in the animal kingdom: *lungs*, which are made up of branched tubes and cells placed within the body; *gills*, or *branchiæ*, which are vascular processes developed on some part of the exterior of the body; and *tracheæ*, which are tubes that ramify to extreme minuteness, and are dispersed through nearly all the organs of the body. By the first and last of these organs the free air is in almost all cases respired; by the second the air is mixed with water. The essential part of the process of respiration however is the same in all.

In man, whose lungs may be taken as a type of those of all mammalia, they are thus formed:—The trachea, or windpipe, is a rounded tube continued from the larynx [LARYNX], and commencing about an inch above the upper edge of the breast-bone. Its front and sides are chiefly composed of portions of cartilage forming about three-fourths of rings an eighth of an inch wide; and its back part consists of transverse and longitudinal fibres of elastic (and, according to some, muscular) tissue. The rings are connected by tough cellular and elastic tissues, and by numerous strong longitudinal bands; and the whole tube, as well as its farthest ramifications, is lined by a mucous membrane continued from the larynx, and covered on its free surface by a fine epithelium composed of cells with vibrating ciliæ attached to them.

The trachea divides into two main branches, the bronchi, one of which goes to each lung, and in it divides into smaller and smaller branches,

whose structure is in all essential respects similar to that of the trachea). Around the ex-



1, the larynx; 2, trachea; 3, right bronchus; 4, left bronchus; 5, left lung, the fissures denoted by the two lines which meet at 6, dividing it into two lobes, and the smaller lines on its surface marking the division of the lobes into lobules; 7, large bronchial tubes; 8, minute bronchial tubes terminating in the air-cells or vesicles.

tremity of each of the finest branches of the bronchial tubes there are arranged a number of delicate rounded cells or vesicles, all opening into the end of the branch, but having no communication with each other. On the walls of these cells the blood circulates in the minutest capillary divisions of the pulmonary artery and veins, and it is also in these cells that the air, which is admitted to them through the bronchial tubes, comes nearly into contact with the blood. [HEART.] The pulmonary artery arising from the right ventricle carries to the lungs all the blood that has been circulating through the body; one main branch goes to each lung, and, accompanying the bronchus, divides, like it, to extreme minuteness. At the last its branches terminate in the capillaries, which are arranged in the most delicate network on the walls of every pulmonary cell. Each of these cells is about $\frac{1}{45}$ of an inch in diameter; the capillary vessels are about $\frac{1}{3500}$ of an inch in diamenter; and the network which they form is so close that its meshes are not more than $\frac{1}{4000}$ of an inch wide. In its passage through these the blood undergoes the changes which convert it from venous to arterial, and render it again fit for the maintenance of life. [BLOOD.] From the capillaries it passes into the pulmonary veins, and through them to the left side of the heart.

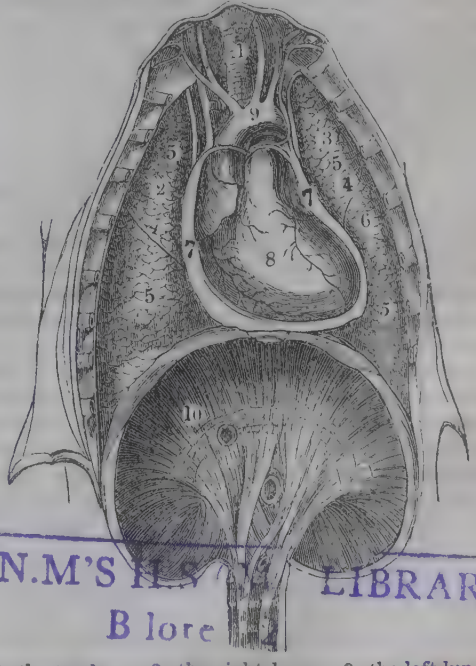
The lungs are thus mainly composed of air-cells and of branches of the pulmonary artery and veins. Each lung is divided into two or three large portions called lobes (the right lung has almost always three lobes, the left two), each of which receives one of the main divisions of the bronchus, artery, and vein; and these are again

divided into lobules, the outlines of some of which are marked by the angular figures on the surface of the lung. Lastly, the cells are grouped together in still smaller lobules not more than a quarter of an inch in diameter.

The lungs are placed in the two principal cavities of the chest. The bony frame-work of the chest is bounded behind by the spine and the ribs as far outwards as their angles, in front by the sternum, or breast-bone, and the cartilages of the ribs, and on each side by the bodies of the twelve ribs. The space which is left below in the skeleton is filled up by the diaphragm, a large muscle, whose form may be roughly compared to that of the expanded part of an umbrella having its concavity downwards. The diaphragm forms a moveable partition between the cavity of the chest and that of the abdomen, permitting only the passage of certain vessels, &c. from the one to the other. By its alternate contractions and relaxations it increases and diminishes the capacity of the chest.

The spaces between the several ribs are filled by the intercostal muscles. Between each two ribs there are two layers of muscle, the fibres of each of which cross those of the other. The fibres of the outer layer pass obliquely from above downwards, and from behind forwards; those of the inner layer pass with a similar obliquity from before backwards.

The whole chest thus forms a cavity closed on all sides, but permitting the passage of certain tubes (the trachea, œsophagus, blood-vessels, &c.) through its walls. This cavity contains within it three subordinate cavities; the middle one contains the heart in the pericardium, and each of the two at the sides contains one of the lungs. These are called the pleural cavities.



1, the trachea; 2, the right lung; 3, the left lung; 4, fissures dividing each lung into, 5, large portions called lobes; 6, smaller divisions termed lobules; 7, pericardium; 8, heart; 9, aorta; 10, diaphragm separating the cavity of the thorax from that of the abdomen.

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The acts of breathing are—*inspiration*, by which air is drawn into the lungs, and *expiration*, by which it is again expelled from them. In inspiration the muscles that are attached to and form part of the walls of the chest contract, and by raising the ribs and sternum, and flattening the diaphragm, increase its capacity. The air within the lungs (which are never empty even after the deepest expiration) is thus for the instant rarefied; but, by the proportionally increased pressure of the atmosphere upon the upper part of the larynx, a fresh quantity of air immediately passes into the air-tubes, and maintains the equilibrium of pressure between the air within and that without the lungs.

As soon as the action of the muscles of inspiration has ceased, expiration commences; the lungs, distended in inspiration, contract by their own elasticity, and expel a volume of air which, in ordinary circumstances, is equal to that which they had just previously received. As fast as they contract, they are followed by the walls of the chest, which collapse partly by their elasticity, and partly by the pressure of the atmosphere upon their exterior, which, when the lungs begin to contract, is no longer exactly balanced by the pressure exerted through the medium of the lungs upon their interior. The lungs having thus contracted to a certain extent, the parts are restored to the same condition as before inspiration, and in ordinary circumstances that action is soon again commenced.

By these actions the cavity of the chest is increased in every direction: in height, by the descent of the diaphragm; in width, by the turning outwards of the ribs; in depth, by the ascent of the sternum. In quiet inspiration the greater part is effected by the diaphragm; in deep inspiration not only are all the muscles already mentioned contracted, but a number of others capable of raising the ribs are called into play, and the capacity of the chest is thus yet further increased in the manner just described.

In their medium state the lungs of a person of ordinary size, and in good health, contain about twelve pints of air; in perfectly easy breathing, about a pint is drawn into them at each inspiration; but from this the quantity may vary to as much as seven pints, according to the force of inspiration, increased as it is, for example, when preparing for a great muscular effort, or during singing, or before coughing.

Such are the movements of respiration. These however are less important than the chemical changes effected in it, and are even not observed in certain classes of animals, in which the latter are nevertheless constantly carried on. The object of the movements of respiration is the constant renewal of the air in the bronchial tubes and cells. During these movements, oxygen is brought in contact with the blood, and carbonic acid gas is expelled.

These changes are effected not by any vital act of secretion, but by the tendency to mixture of the different gases, which is not obstructed by the delicately-porous tissues of the air-cells and the capillary vessels.

It appears from the experiments of Magnus (which are in great part confirmed by those of Stevens, Hoffmann, Gmelin, Bertuch, and Bischoff), that the mean quantity of gas contained in the blood is equal to $\frac{1}{10}$ of its whole volume. In venous blood the average quantity of carbonic acid is about $\frac{1}{18}$, that of oxygen about $\frac{1}{85}$, and that of nitrogen about $\frac{1}{100}$ of the volume of the blood; in the arterial blood their respective quantities are $\frac{1}{14}$, $\frac{1}{38}$, and $\frac{1}{72}$. (Müller's 'Physiologie,' vol. i., ed. 2.) It follows therefore that the purpose of respiration is chiefly the absorption of oxygen, and not merely the removal of carbonic acid from the blood; a conclusion which is also rendered probable by the fact that frogs placed in hydrogen or nitrogen die as if suffocated, although as much carbonic acid is given off from their lungs as when they breathe in atmospheric air.

The constant process of respiration effects changes in the blood that are of the first importance to life and health. The watery vapour exhaled from the blood as it passes through the lungs more nearly in contact with the atmosphere than it is at any other part of the system, amounts, according to the experiments of Lavoisier and others, to nearly 8000 grains in 24 hours. The quantity of carbonic acid given off during the same time is estimated to be at the least 14,930 cubic inches, or 8534 grains, containing 2820 grains of carbon; and the quantity of oxygen absorbed amounts in different circumstances to from $\frac{1}{5}$ to $\frac{1}{2}$ more than that of the carbonic acid given out. During the process of the union of the oxygen, heat is produced, which is the source of animal heat. [HEAT, ANIMAL.]

Dr. Prout has shown that the quantity of carbonic acid separated from the blood varies at different periods of the day; it is greatest between 11 A.M. and 1 P.M., and least between $\frac{1}{2}$ past 8 P.M. and $\frac{1}{2}$ past 3 A.M. Its quantity is also diminished by anxiety and other depressing passions, by exercise, by strong drinks, or vegetable food; but it is increased when the barometer is low. The suspension of respiration by any cause produces asphyxia, or suffocation. [ASPHYXIA.]

RESPIRATOR, or breath-warmer, an instrument invented some years ago for giving warmth to the air drawn into the lungs in breathing, and thereby enabling invalids to whom cold air is injurious to enjoy the benefits of exercise in the open air without injury or inconvenience.

The apparatus usually consists of from eight to twelve frames of sheet-silver or other metal, about three inches and a half long, one inch and a half wide, and $\frac{1}{200}$th part of an inch thick; the metal of which is pierced away by machinery so as to leave merely a narrow frame containing six vertical bars of $\frac{1}{30}$th and five horizontal bars $\frac{1}{90}$th of an inch wide. On both sides of each of these frames a layer of wires an inch and a half long and $\frac{1}{450}$th of an inch thick is soldered, care being taken to connect each wire, not only with the top and bottom bars of the frame, but also with each of the five horizontal bars. The wires are laid about $\frac{1}{200}$th part of an inch apart, and are so numerous that a large respirator of high power

contains 2000 feet of wire, divided into about 12,000 pieces, and soldered to the frames at more than 80,000 distinct points. The frames or lattices of wire-work are fixed parallel to each other, and kept a short distance apart by small studs of a substance which is a slow conductor of heat, so that the inner layer is always kept, as nearly as possible, at the temperature of the air expelled from the lungs, and each successive layer diminishes in warmth, till the outer one is nearly as cold as the external air. The curious and philosophical application of a non-conducting medium between the metallic screens is essential to the perfect action of the instrument, as without it the heat would be equally diffused, and no part of the metal-work could retain more than half the temperature of the breath. By this arrangement the air inhaled, finding each layer of wire warmer than the preceding, is gradually raised, in respirators of the highest power, to the greatest attainable temperature. These instruments are more especially useful in diseases of the lungs.

REST, in music, a character denoting silence; a cessation of sound equal in duration to the note represented by the *rest*. These rests have the following forms :—

Each of these rests is double the length of the one next following it.

RESTIA'CEÆ, a natural order of plants, principally inhabiting the southern hemisphere, and nearly related to the Cyperaceous order of Europe. They abound at the Cape of Good Hope and in New Holland, where they form a hard, wiry, rushlike herbage.

RESTITUTION.—*Restitution of Stolen Goods.* By 7 & 8 Geo. IV. c. 29, s. 57, if any person guilty of a felony or misdemeanor under that act, in stealing, converting, or receiving any property, shall be indicted for such offence by the owner or his executor, and convicted, the property shall be restored to the owner, and the court before whom the person shall be convicted shall have power to award writs of restitution for the property, or order it to be restored in a summary manner. Provided that, if it shall appear that any valuable security shall have been bonâ fide paid or discharged by some person liable to pay it, or being a negociable instrument shall have been bonâ fide taken or received by transfer or delivery by some person for a valuable consideration, without any reasonable ground to suspect that it had been stolen, &c., then the court shall not order the restitution of such security.

Before this act the owner was in all cases entitled to restitution on conviction for a felony, but not for a misdemeanor.

RESTORATIONS, in Architecture, a term applied to drawings intended to show ancient buildings according to their original design, as made out from their existing remains, aided by such descriptions or hints as are to be obtained from classic authors, or from the representations of them on coins.

RESUSCITATION (from *resuscito*, to arouse, to revive), the restoring to animation of persons apparently dead. [Asphyxia; Drowning.]

RETFORD, EAST. [Nottinghamshire.]

RETHEL. [Ardennes.]

RETI'CULUS, or RETICULUM RHOMBOIDA'LE (the Rhomboidal Network formerly used to divide the field of a telescope), a southern constellation of Lacaille, situated directly between the great stars of Argo and Eridanus.

RETIMO. [Candia.]

RETINA. [Eye.]

RETINASPHALTUM occurs in irregular opaque masses of a pale brownish-yellow colour, having a glistening lustre and imperfect conchoidal fracture. It is soft and brittle, melts when placed on hot iron, smokes, and afterwards burns with a bright flame, emitting a fragrant odour. Partly soluble in alcohol, leaving an unctuous residue. It consists chiefly of resin and bitumen.

RETORT, a chemical vessel in which distillation or decomposition is effected by the application of heat. For different purposes retorts are made of glass, earthenware, and metal; and the form varies according to the mode in which the retort is to be used.

In general, when the application of the higher temperatures is required for distillation or decomposition, earthen retorts are employed. In preparing hydrofluoric acid, lead is used; and in concentrating sulphuric acid, platina retorts are now largely employed, and would be universally so, were it not for their very high price.

In the destructive distillation of coal [Gas Lighting] iron retorts are used, and also, on the small scale, for obtaining oxygen from the peroxide of manganese, and in various other chemical operations.

RETRENCHMENT, in Fortification, is a work constructed within another, in order to prolong the defence of the latter by impeding or preventing the formation of lodgments when the enemy has gained possession of it; or to afford protection to the defenders till they can retreat with safety or obtain a capitulation. In the latter respects the interior work is called by the French engineers a *Reduit*.

The principal works in permanent fortification are usually provided with retrenchments or reduits; and some of these are constructed at the same time as the work itself, while others are often executed only a short time before they are wanted.

The defence of a fortress is now however rarely continued after a breach has been made in the rampart of the enceinte; though if the bastion were retrenched, the governor might sustain an assault without any risk of being refused a capitulation, or of seeing the town given up to be plundered. In the event of the assailants gaining the top of the breach, the defendants would be able to retreat within the retrenchment, the fire from which might then be concentrated upon the enemy while confined within the comparatively narrow space between the faces of the bastion.

The simplest kind of retrenchment, consisting of an earthen parapet, is that which is shown at

X [FORTIFICATION]; but Cormontaingne proposed to retrench small bastions by constructing within them cavaliers of the same form as the bastion itself, and having a command of 5 or 6 feet above it. The fire from this high parapet might give the work some advantages during the progress of the siege; but from its figure a cavalier appears to be less proper than the retrenchment at X for the defence of the terreplein at the top of the breach.

The first retrenchments in ravelins were merely walls pierced with loop-holes for musketry and covering the steps at the gorges; but when Vauban increased the size of the ravelin, he made this reduit, or retrenchment, to consist of a rampart and parapet similar to those of the ravelin itself, as at Neuf Brisac; and Cormontaingne subsequently enlarged the work, so as to render it a second ravelin, as at Y [FORTIFICATION]. In order that the defenders might be able to retain possession of the extremities of the ravelin, near the main ditch, after the salient part may have been taken, retrenchments, or coupures, as they are called, similar to the traverses, *t*, *t*, &c., are recommended to be formed across the terreplein of the ravelin. Behind these some of the defenders may retire, and keep up a fire against the enemy's lodgment near Z.

The advanced works about a fortress are recommended to be retrenched with round towers of masonry, provided with tiers of loop-holes for musketry. These are called *Safety Redoubts*.

RETROGRADE, moving backwards, as opposed to *Direct*. In astronomy all motion from east to west is retrograde; thus the apparent motion of the heavens is retrograde, and the earth's diurnal motion, which causes it, is direct.

RETZ (JEAN FRANÇOIS PAUL DE GONDI), CARDINAL DE, was born in Oct. 1614. Destined by his father to the church, he was compelled to enter upon a profession unsuitable to his unscrupulous and intriguing temper. Nevertheless, though profligate and debauched, he pursued his theological studies with zeal, and gained the good opinion not only of the clergy, but of Louis XIII., who, on his deathbed (1643), named Gondi coadjutor to his uncle the archbishop of Paris. Gondi devoted himself zealously to discharge the external functions of his office. But his profuse distribution of alms, while it established his popularity with the citizens, made him an object of suspicion to the court. This distrust, joined to his own ambition, led him to become the moving spirit of the popular party. [FRONDE.] Throughout the wars of the Fronde he maintained his ascendancy; and when the court, after having been obliged to quit Paris for a short time, returned in October, 1652, tempting offers were made to induce Gondi, who had now risen to the rank of cardinal, to quit his see and repair to Rome, with the title of ambassador. While he was hesitating, and seeking to make terms for his friends, he was arrested, Dec. 19, and was for some time confined at Vincennes, whence he was removed to Nantes, but escaped into Spain in 1654. After leading for some years a wandering life, he effected his reconciliation with Louis XIV., and his restoration to France. The remainder of his life was spent chiefly in retirement, in works of charity and piety. He died at Paris, Aug. 24, 1679.

REUCHLIN, JOHANN, was born in 1455, at Pforzheim, in the dominions of the margrave of Baden, who having observed his aptitude for learning, sent him to Paris in 1473, as companion to his son. At Paris Reuchlin prosecuted his Greek studies. In after life we find him successively at Basel, Orléans, Poitiers, and lastly Tübingen, where, having previously taken his degree in law, he commenced practice as an advocate, about 1481. In 1482 he visited Rome and other of the chief towns of Italy, as secretary to the Count of Würtemberg, and was received at the court of Lorenzo de' Medici with distinguished respect. On his return to Germany, he took up his abode at Stuttgardt; and, from 1484 to 1509, filled a variety of high legal and diplomatic functions. In the latter year he became entangled in a long dispute, arising out of an edict obtained by Pfefferkorn, a converted Jew of Cologne, authorising him to examine and burn all Jewish books containing anything against the Christian religion. In the troubled times which followed the commencement of the Reformation, Reuchlin had his share of distress and poverty. In 1518 he accepted, and held for a short time, the Greek and Hebrew professorships at Wittenberg; and he afterwards taught Greek and Hebrew at Ingolstadt for somewhat less than a year. In 1520 or 1521 he was appointed to the same chairs at Tübingen, a pleasant gleam over the close of his troubled life; crowds of students from all parts of Germany testified the respect in which his name and learning were held. He died at Stuttgardt, June 30, 1522.

As a scholar, Reuchlin's name stands high among the men of his age. He was suspected of a leaning towards the Reformed doctrines, but never separated himself from the Roman church. His numerous writings comprehend some elementary works on Hebrew, esteemed in their day, and some treatises on the cabalistic art.

REUILLY. [INDRE.]

REUNION, ISLE OF, the name given by the French Republican Government to the Isle of BOURBON, in a decree dated March 8, 1848.

REUSS. [CATALUÑA.]

REUSS, a principality in the interior of Germany, formed of two isolated territories that lie respectively in the upper part of the basin of the Saale and the Elster, and are disjoined by the intervention of the Weimar circle of Neustadt, is situated between 50° 20′ and 51° N. lat., 11° 40′ and 12° 20′ E. long. The southern portion, consisting of the lordships of Greiz, Saalburg, Schleiz, and Lobenstein, lies between Bavaria, Saxony, Weimar, Schwarzburg and Saxe-Meiningen. The northern part, which is drained by the Elster, lies between Altenburg, Weimar, and Prussian Saxony. The area of the whole is 590 square miles, and the population in 1847 was 112,175.

The country, especially in the southern part, is mountainous, being traversed by the Frankenwald,

which rises to 2300 feet in height. There are many well-cultivated valleys, of which the two watered by the Saale and the Elster are the largest and most fruitful. There are also fine forests of pine and other timber, and rich pastures. The natural productions are some corn, fruit, hops, flax, and timber, horned cattle, sheep, game, and fish. The mineral kingdom yields iron, copper, lead, some silver, alum, gypsum, vitriol, and salt. The inhabitants manufacture woollen cloth, calico, stockings, hats, earthenware, china, tobacco, alum, vitriol, beer, and iron.

The territory is divided between two lines of a princely family, the elder of which possesses only the lordship of Greiz, with an area of 144 square miles, and a population of 35,159. The younger line is subdivided into branches—Reuss-Schleiz and Reuss-Ebersdorf-Lobenstein—whose respective territories have an area of 129 and 164 square miles. These branches possess the principality of Gera in common. In 1813 both lines joined the German Confederation; the government is a sort of limited monarchy. The elder furnishes a contingent of 223 men, the younger of 522 men, to the army of the Confederation.

The capital is *Gera*, a well-built town with about 9000 inhabitants on the Elster. It has a gymnasium, a theatre, a training school for teachers, a house of correction and two hospitals. Woollen and cotton stuffs, hats, leather, musical instruments, porcelain, and earthenware are manufactured. *Greiz*, also on the Elster, has a palace and park, a gymnasium, and 7000 inhabitants, who manufacture woollen cloth, calico, and paper. *Zeulenroda*, W. of Greiz, has a handsome church, manufactures of hosiery, woollen cloths, and beer; and a population of 4300. *Schleiz*, on the left bank of the Wiesenthal, a feeder of the Saale, is a pretty town with 5000 inhabitants, a palace, gymnasium, and manufactures of broad cloth, cotton, leather, and beer. *Lobenstein*, on the Lemnitz, a feeder of the Saale, has a palace, a public library, and 3000 inhabitants. Near it are large iron works. *Ebersdorf*, a small place of 1200 inhabitants, lies N. of Lobenstein.

REUTLINGEN, the chief town of the circle of the Schwarzwald, in Würtemberg, is situated 20 miles S. from Stuttgardt, at the foot of Mount Achalm, on the river Echatz, in a beautiful and fertile country, and has about 11,000 inhabitants. It is surrounded with moats and old turreted walls, and has four principal gates. The town is regularly laid out, but ill built. The Marienkirche which was founded in 1273, and has a steeple 325 feet high; the town-house, and a Franciscan convent, now converted into government offices, are the largest buildings. Reutlingen has a lyceum, a public library, manufactures of woollen cloths, cotton, lace, leather, hats, cutlery, glue, &c., and a considerable trade in corn, fruit, &c.

REVAL, or REVEL, the capital of the Russian government of Esthonia, is situated in 59° 26′ N. lat., 24° 35′ E. long., on the Gulf of Finnland, and has 23,000 inhabitants. It is very strongly fortified, and in 1824 the harbour, which is one of the best in the Gulf of Finnland, was made capable of receiving the Russian Baltic fleet. It has narrow irregular streets and dark old-fashioned houses. The best part of the city is the Dom, which is in fact a distinct portion, surrounded with walls and towers in the old style. It is on an eminence called the Domberg, on the west side of the city, commanding an extensive view of the sea. Most of the houses of the nobility are in this part. There are likewise two extensive suburbs. The principal public buildings are the cathedral, the arsenal, the town-house, the admiralty, gymnasium, and the naval and military hospital. There are several schools, and a public library in the town. The manufactures are cotton goods, hats, stockings, leather, powder, starch, pins, needles, earthenware, looking-glasses, &c. There is also a cannon and bell foundry. The trade of Revel is greatly on the decline; between 80 and 90 vessels enter and leave the harbour yearly. The exports consist of corn, flax, tallow, spirits, &c.

REVEL. [Garonne, Haute.]

REVELATION. [Religion.]

REVELATIONS, BOOK OF. [Apocalypse.]

REVELS, MASTER OF THE, an officer in great houses formerly appointed *pro tempore* to manage the Christmas diversions from Allhallows-Eve to Candlemas-Day; more ordinarily called the *Lord of Misrule*. In the royal household however the master of the revels was a permanent officer, and was called Master of the Tents and Revels or Masks and Revels. The permanent office of master of the revels was first instituted in the reign of Henry VIII. No mention of this office has been found subsequently to the reign of King Charles II.

(See the 'Archæologia,' vol. xviii., p. 318, &c., and 'The Loseley Manuscripts,' edited by A. J. Kempe, Esq., 8vo., Lond., 1836. Various papers in illustration of the office in Queen Elizabeth's time are contained among the Lansdowne MSS. in the British Museum: see also MS. Addit., Brit. Mus., 5750.)

REVERSION. [Life Insurance and Reversion.]

REVERSION. 'Reversion of land is a certain estate remaining in the lessor or donor, after the particular estate and possession conveyed to another by lease for life, for years, or gift in tail. And it is called a reversion in respect of the possession separated from it: so that he that hath the one, hath not the other at the same time, for being in one body together, there cannot be said a reversion, because by the uniting the one of them is drowned in the other. And so the reversion of land is the land itself when it falleth.' ('Termes de la Ley.') Thus if a man seised in fee simple conveys lands to A for life, or in tail, he retains the reversion in fee simple. In all cases where the owner of land, or the person who has an estate in land, grants part only of his estate, he has a reversion; and as the grantee holds of him, there is tenure between them, and the grantor has a seignory by virtue of having a reversion. When a man grants all his estate to another, or grants a particular estate to A, and various remainders over, remainder to F in fee, he has no reversion left, and therefore he has no

seignory since the passing of the statute of Quia Emptores. The remainder-men also who precede the remainder-man in fee, do not hold of such remainder-man, but of the lord of the fee, of whom the original owner held. The word reversion is often used inaccurately, and it is sometimes necessary to recur to its strict legal signification.

By the 3 & 4 Wm. IV. c. 104, reversionary estates or interests in lands, tenements, and hereditaments, corporeal and incorporeal, are assets to be administered in courts of equity for the payment of a person's debts both on simple contract and on specialiy, when such person shall not by his last will have charged such estates or interests with or devised them subject to the payment of his debts.

REVERSION OF SERIES. In the nomenclature of mathematics, which is far from being consistent with itself, the words *reversion* and *inversion* are sometimes confounded. Thus the term by which we describe the square root, as connected with the square, is, that each is an inverse process to the other; but if y be a given series of powers of x, the determination of x in a series of functions of y is not called inversion, but reversion.

REVETMENT, in permanent Fortification, is a wall of brick or stone retaining the mass of earth which constitutes the rampart, generally on the exterior side only, or retaining the earth which forms the opposite side of the ditch. The exterior faces of these walls are considered as the scarp and counterscarp of the ditch.

In and before the time of Vauban the scarp revetments were raised from the bottom of the ditch to the top of the parapet; but the part which was visible above the glacis being destroyed by the enemy's artillery, and the parapet in consequence partly ruined soon after the commencement of the siege, that engineer in most of his works raised his revetments no higher than the level of the crest of the glacis, or about 7 feet above the natural ground; the exterior of the parapet was then left at such an inclination to the horizon (45° in general) that the earth would support itself. The ditch of a fortress being about 18 feet deep, the height of the scarp revetment was consequently 25 feet, and this was considered sufficient to afford security against the danger of having the rampart escaladed. At present it is recommended that the main ditch should be 24 feet deep, and in this case the scarp revetment is above 30 feet high.

In order that the revetment might most effectually resist the pressure of the earth which it is to support, Vauban gave to the exterior face of the wall a slope, whose horizontal breadth was equal to one-fifth of the height; this was subsequently reduced to one-sixth, and not long since there were thought to be some advantages in making the face vertical.

Some ramparts are now formed of earth, unsupported by revetments; and even the opposite side of the ditch, instead of being faced with a steep wall, is occasionally formed with a gentle slope from the level of the natural ground to the bottom of the ditch. This construction has recently been put in practice on the continent by engineers who have adopted the ideas of Montalembert and Carnot; and at the foot of each principal rampart is a high detached wall, with loop-holes. This, being covered by a counter-guard of earth, was supposed to be incapable of being destroyed by the artillery of the besieger, and consequently an insurmountable obstacle to the passage of the ditch in an attempt to assault the rampart.

Counterforts or buttresses are built about 15 feet asunder on the side of the revetment, which is contiguous to the rampart: these are to serve in part as props to keep the wall from inclining in consequence of partial compressions; but chiefly to increase, at the places where they are formed, the length of the arm of the lever by which the weight of the wall resists the lateral pressure of the earth. It has been recommended to connect the tails of every two counterforts by a wall curved on the plan, and having the convex side towards the earth which is to be retained. Again, the nearest sides of every two counterforts have occasionally been connected by two or more arches, one above another; by which means the mass of retained earth is in part supported, and the lateral pressure of the whole is diminished.

Revetments in which the counterforts are connected in either of those ways are said to be counter-arched; and it is recommended that the masonry of the arches in the rampart should be but slightly connected with that of the revetment, since then the greater part of the rampart and parapet will remain supported by the arches even after the revetment has been demolished by the artillery of the besiegers.

The exterior and interior faces of the revetment or retaining wall of a dock, have in a vertical section the form of concentric arcs of circles, with their convexities towards the land; and this form is given them that the stones may be able to resist the hydrostatical pressure of any water which, when the dock is full, may get behind the wall, and which may be prevented from escaping when the dock is made dry.

REVOLUTION. This well-known term is applied in astronomy to the manner in which a detached body moves round another, as a planet round the sun; but the motion of connected particles of matter round an axis, such as the diurnal revolution of a planet, is more usually called *Rotation*.

In pure mathematics the word revolution is applied to the angle moved over by a line which revolves round a point from any one position to that position again; it is therefore a synonym for four right angles.

REYNOLDS, SIR JOSHUA, was born at Plympton, July 16, 1723. He was the son of the Rev. Samuel Reynolds, Rector of Plympton St. Mary, and master of the free grammar-school there. He was intended by his father for the medical profession; but manifesting a decided taste for art, he was sent to London, and placed with Hudson, the principal portrait painter of that time. Reynolds and his master did not agree,

and they separated in an unfriendly manner at the expiration of two years. Reynolds returned into Devonshire, and upon this slight foundation commenced his career as a portrait painter, at Plymouth Dock. After the death of his father, in 1746, Reynolds returned to London, where he commenced practice in St. Martin's Lane. In 1749 he went to Rome. While studying the various great works of art in the Vatican, he caught a severe cold, which caused the deafness to which he was subject during the remainder of his life. From Rome he went to Florence, Bologna, Parma, Modena, Milan, Padua, and Venice. From Venice he went through Turin to Paris, where he made a short stay, and returned to Plymouth towards the end of 1752.

By the advice of Lord Mount Edgcumbe, who had been his early patron, Reynolds returned to London, and took apartments in St. Martin's Lane. He soon afterwards attracted general attention by a portrait of Joseph Marchi, in a Turkish dress, a young Italian whom he had brought with him as an assistant from Rome. He next took a house in Great Newport Street, where he continued some years. One of his first works of value was a portrait of the then Duke of Devonshire, but that which established his fame as the first portrait painter of his country was a full-length of his friend Commodore Keppel. It was about this time that he contracted an intimacy with Dr. Johnson, which only ended with the death of the latter. In 1761 he purchased a house in Leicester Square, where he fitted up an elegant painting-room, and built a spacious gallery for his collection of works of art; and here he resided during the remainder of his life. In 1761 the first public exhibition of works of art took place, in the room of the Society of Arts, in which Reynolds had four pictures; and in the exhibition of the following year he exhibited his portrait of Lord Ligonier on horseback (now in the National Gallery), and one of Sterne. In 1762 he painted his celebrated picture of Garrick between Tragedy and Comedy: it was bought by the Earl of Halifax for three hundred guineas. In 1764 Reynolds and Johnson instituted the Literary Club.

Upon the foundation of the Royal Academy in 1768, Reynolds was unanimously chosen president, and the honour of knighthood was conferred on him. The Academy was opened on January 1, 1769, and the president delivered a discourse in commemoration of the event. Lecturing was no part of the duty of the president; it was a task which Sir Joshua imposed upon himself. He delivered fifteen of these discourses, which have been generally and deservedly admired.

In 1773 Sir Joshua painted his celebrated picture of Count Ugolino with his sons, from Dante: it was purchased by the Duke of Dorset for four hundred guineas. In this year Sir Joshua was created Doctor of Civil Law by the University of Oxford, and about the same period he was also elected a member of the Imperial Academy of Florence. In 1780 and the following three years, Sir Joshua was engaged upon his designs for the window of New College Chapel, Oxford. In 1784 he painted his allegorical portrait of Mrs. Siddons as the Tragic Muse, which was purchased by W. Smith, Esq., for 700 guineas. Upon the death of Allan Ramsay, this year, Sir Joshua was appointed principal painter in ordinary to the king.

In 1786 he painted his Infant Hercules strangling the Serpents in the Cradle, for the Empress Catherine of Russia. It was sent to St. Petersburg in 1789, and in 1790 the Russian ambassador presented him with a gold box having the portrait of the empress upon the lid, set with large diamonds. His executors afterwards received 1500 guineas as the price of the picture. Sir Joshua painted three pictures for Alderman Boydell's Shakspere—the Cauldron Scene in Macbeth, Puck in Midsummer Night's Dream, and the Death of Cardinal Beaufort.

Sir Joshua Reynolds died Feb. 23, 1792, in the 69th year of his age. His body, after lying in state in Somerset House, was buried with great pomp in St. Paul's Cathedral, where, some years afterwards, a statue, executed by Flaxman, was erected to his memory.

Sir Joshua Reynolds was never married; the principal portion of his property, which amounted to 80,000*l.*, he bequeathed to his niece, Miss Palmer, who shortly afterwards was married to the Earl of Inchiquin, subsequently created marquis of Thomond. His collection of works of art sold for about 17,000*l.*

His literary productions, besides his 'Discourses delivered in the Royal Academy,' were three contributions to the 'Idler,' some notes to Mason's translation of Du Fresnoy's 'Art of Painting;' a few notes for Dr. Johnson's edition of Shakspere, and his remarks upon the works of the Dutch and Flemish painters during a tour through Flanders and Holland in 1781.

Reynolds has been justly said to be the founder of the British school of painting. Through a happy combination, and a judicious and powerful application of qualities, whether originating in natural feeling, or acquired by selection from other masters, he struck out a new path in portrait, and by uniting graceful composition and breadth of light and shade with a rich and mellow tone of colouring, he invented a style of his own. The beauties of Sir Joshua's style were displayed to great advantage in the portraits of females and children. All his principal works have been engraved.

(*Memoirs of Sir Joshua Reynolds, Knt.*, by James Northcote, R.A., 2 vols. 4to., Lond., 1813.)

REZAT, called Middle Franconia, a circle in the kingdom of Bavaria, is situated between 48° 41′ and 49° 45′ N. lat., 10° 5′ and 11° 40′ E. long. It is bounded N. and E. by the circles of Lower and Upper Franconia, E. by the Upper Palatinate, S. by the Upper Danube, and W. by Würtemberg. The area is 2914 square miles, and the population in 1846 was 527,866. The circle is traversed by several chains of hills of no great elevation, capable of cultivation, or covered with valuable timber. No other circle in Bavaria contains so many fertile valleys and such a rich soil. The Danube touches the circle for a short distance on the south, and receives the Wörnitz and the

Altmühl. The principal river of the interior of the circle is the Regnitz, which is formed by the junction of the Rednitz and the Pegnitz, the latter again being formed by the junction of the Upper and the Lower Rezat. All the other rivers fall into the Regnitz, which itself falls into the Main near Bamberg, in Upper Franconia. The circle is traversed by the *Ludwigs* canal, which runs up the Altmühl from Kelheim, reaches its summit level at Neumarkt, thence passes to the Regnitz, near Nürnberg, and enters the Main below Bamberg, thus uniting the Danube and the Rhine. The railway from Munich through Augsburg to Leipzig crosses this circle and passes by Nördlingen, Nürnberg, and Fürth.

All kinds of corn, millet, pulse, garden fruits, flax, hemp, tobacco, madder, and hops, are grown, and in such abundance that of all, except madder, there is a surplus for exportation. The forests are very considerable. Most of them consist of firs, but there are some woods of oak, elm, &c. Cattle, horses, and sheep are numerously reared and of improved breeds. Oxen are employed in agriculture, as well as horses. But few swine and bees are bred. Fish abound in the rivers. The products of the circle are chiefly agricultural; but there are manufactures of woollen cloth, cotton, linen, leather, stockings, &c., in the towns.

The chief towns are—FÜRTH: NÜRNBERG: *Erlangen*, on the right bank of the Regnitz, which has a university, gymnasium, an anatomical school, a botanical garden, a palace, a public library, and 10,000 inhabitants, who manufacture tobacco, broadcloth, hosiery, hats, gloves, beer, leather, looking-glasses, &c.: *Schwabach*, which stands on the Schwabach, 9 miles by railway S. from Nürnberg, and is a walled town with 3 churches, a town-house, a synagogue, several schools, and 7160 inhabitants, who manufacture nails, gold and silver wire, oil-cloth, calico, sealing wax, and paper: *Nördlingen*, a fortified town, with a manufacturing population of 6300, 49 miles by railway S.S.W. from Nürnberg, and close to the Würtemberg frontier: and *Dinkelsbühl*, a manufacturing town of 5200 inhabitants, on a feeder of the Wörnitz.

RHÆ'TIA appears to have comprehended the whole country between the north of Italy and the Danube, and consequently to have included Vindelicia. In the time of Augustus these two countries formed two separate provinces, of which Rhætia was bounded on the W. by the Helvetii, on the E. by Noricum, on the S. by Gallia Cisalpina, and on the N. by Vindelicia, from which it was separated by the Brigantinus Lacus (Boden See, or the Lake of Constanz) and the river Œnus (Inn). It included the greater part of the Tyrol and the eastern cantons of Switzerland.

Augustus sent his step-son Drusus against the Rhæti (B.C. 15), who subdued the southern part of the country; but as they still continued to trouble the province of Gaul, Tiberius, the brother of Drusus, was also sent against them, who attacked them near the Boden See, and conquered the whole country. The victories of Drusus and Tiberius are celebrated by Horace ('Carm.,' iv. 4, 14).

The great chain of the Alps passes almost through the centre of this province, and was called the Alpes Rhæticæ. Several rivers rise in these mountains, of which the largest are the Rhenus (Rhine), the Áthesis (Adige), the Addua (Adda), and the Œnus. The valleys between these mountains were very fertile, and were particularly celebrated for their grapes, from which excellent wine was made. The only town of any importance in Rhætia was Tridentum (Trent) on the Athesis, the capital of the Tridentini.

RHAM, WILLIAM LEWIS, was born at Utrecht, in the Netherlands, in 1778. Mr. Rham came to England in early life. He studied for some time at Edinburgh, with a view to the medical profession; but eventually the church became his destination, and he entered at Trinity College, Cambridge. In 1806 he took his degree of M.A. In 1808 Mr. Rham was presented to the living of Winkfield, Berkshire; and a few years afterwards to that of Fersfield, in Norfolk. He died unmarried at Winkfield, after a short illness, Oct. 31, 1843.

The life of Mr. Rham was characterised by active and unremitting usefulness as a parochial clergyman. But it is as a scientific agriculturist that Mr. Rham's name is most widely known. His early connection with the Continent, which was kept up in after life, afforded scope for observation of the husbandry of different countries; and his thorough knowledge of several living languages gave him access to the works of scientific writers on foreign agriculture.

He was an active member of the Royal Society of Agriculture, from its formation in 1838. A volume entitled 'The Dictionary of the Farm,' which contains his views on all the principal subjects of interest to the agriculturist, was published by C. Knight in 1845, compiled from the articles which he wrote in the 'Penny Cyclopædia.' He was also the author of 'Flemish Husbandry,' a small work written for the 'Farmers' Series' of the 'Library of Useful Knowledge.' The 'Essay on the Analysis of Soils,' for which he obtained the prize offered by the Royal Society of Agriculture, is published in the Society's 'Journal,' which also contains some other valuable contributions from his pen. Not long before his death he had also commenced a series of papers on agriculture and rural economy in the 'Gardener's Chronicle,' edited by Dr. Lindley.

RHAMNA'CEÆ, a natural order of Exogens, remarkable for having a valvate calyx, hooded petals, opposite to which their stamens are inserted into the tube of the calyx, and a superior or half-inferior fruit which is either dry or fleshy. The species are all shrubs, with small greenish or inconspicuous flowers. Those most common in this country are the *Rhamnus frangula* (Black Alder), *Rhamnus catharticus* (Buckthorn), *Plaiurus Australis* (Christ's Thorn), and the evergreen *Alaternus*, a kind of Rhamnus. The useful species are of some importance: *Rhamnus catharticus* and several others have purgative berries; *Rhamnus infectorius* yields the French Berries of the shops, employed for dyeing yellow; the fruit of the Jujube, *Zizyphus jujube* and *vulgaris*, is

subacid and eatable, and the species are cultivated for it in the south of Europe and the temperate parts of Asia; *Zizyphus Lotus* gave its name to the Lotophagi, or Lote-Eaters of Africa; and *Rhamnus frangula* is extensively cultivated for the manufacture of charcoal.

RHAMNUS, or Buckthorn (the word is Greek, Ῥάμνος), a widely-diffused genus of the natural family of *Rhamnaceæ*, chiefly found in the temperate parts of Europe, in Siberia, and in the Himalayas at elevations of 6500 feet; also in the New World, and at the Cape of Good Hope.

The berries of one species, the *Rhamnus catharticus*, have long been known for their purgative properties, and still continue to hold a place in several Pharmacopœias. This property is participated in by those of other species, as well as by their inner bark. The berries of several species of Rhamnus form articles of commerce from the Mediterranean, under the name of French, Turkey, and Persian Berries, Grains d'Avignon, &c., being valued on account of the colouring-matter which they yield, and which varies from yellow to green. This M. Brongniart supposes to be owing rather to different degrees of ripeness than to essential differences in nature. Sap-green is a mixture of the juice of these berries with those of some others. *R. infectorius, saxatilis, amygdalinus, catharticus,* and *Clusii* are the species generally employed; some for dyeing morocco leather of a yellow colour, others for dyeing wool, and the bark of some for striking a black with the salts of iron. The *Lycium* of the ancients is supposed to have been a species of Rhamnus; hence also one species has been called *R. Lycioides:* it has a hard yellow wood.

RHAPSODY (ῥαψῳδία) is a poem sung by a rhapsódist, and is generally applied to detached parts of the Homeric poems, the Iliad, and the Odyssey, which were sung or recited by rhapsodists. But the word rhapsodist properly signifies one who sews or fastens things together; and it was specially applied to those who arranged or are supposed to have arranged the parts of the Homeric poems and of other old poems, so as to make one entire work of them, and who went about from place to place to sing and recite those poems.

RHATANY. [Ratany.]

RHE'GIUM (in Greek, Rhegion, Ῥήγιον), now Reggio, one of the oldest Greek towns in Italy, is situated on the strait which divides Italy from Sicily. Rhegium was a colony of the Chalcidians, who were joined by a party of Messenian emigrants who left their country during the first quarrel between Messéne and Sparta. Both the town and the name probably existed previous to the establishment of the Chalcidian colony.

After the end of the first Messenian war, a fresh colony of Messenians settled at Rhegium about 723 B.C.; and after the capture of Eira, a third party of Messenian emigrants joined their countrymen at Rhegium, which became a very populous and flourishing city. The government appears to have been a kind of open aristocracy, which, according to some accounts, was vested in one thousand of the citizens.

The history of Rhegium is connected with the history of Sicily and of the Greek towns of southern Italy. Under the Romans, and in the time of Strabo, it was one of the few Greek towns of Italy which preserved their language and customs. Rhegium was taken by the Normans in the 11th century, since which time it has been a part of the kingdom of the Two Sicilies.

In the 16th century Reggio was sacked three times by the Turks. The great earthquake of Calabria, in 1783, completely ruined the town of Reggio, but it has been since rebuilt on a regular plan; it spreads along the declivity of a hill down to the sea. The view of the opposite coast of Messina and its verdant hills, backed by the huge mass of Ætna, is magnificent. The Apennines near Reggio are rugged and bare, but the plain around Reggio is fertile, and most of the ground is laid out in orange and lemon plantations. The extracting of an essence from the rind of the orange and lemon, and the rearing of silkworms, constitute important branches of industry. Reggio is a great nursery of orange and lemon plants for all parts of the kingdom. The climate is temperate, and the atmosphere remarkably pure. The population of Reggio amounts to nearly 20,000. The inhabitants are lively and sociable, and mostly in easy circumstances; the women are good-looking. Reggio is one of the pleasantest towns in the kingdom of Naples. [Calabria.]

The ancient port no longer exists. The small craft of modern Reggio anchor a little to the north of the town, opposite the village of Pentimele. Reggio is about 8 miles south-east from Messina.

RHEIMS. [Reims.]

RHEIN. [Rhine.]

RHEIN-KREIS (*Circle of the Rhine*), now the Palatinate, a province of Bavaria, is entirely detached from the rest of the kingdom, and lies on the left bank of the Rhine. It was assigned by the Congress of Vienna to Austria, which made the country over to Bavaria. It is bounded N.W. by Rhenish Prussia, N. by Hesse, E. by Baden, from which it is separated by the Rhine, and S. by France, Rhenish Prussia, Coburg, and Hesse Homburg; the area is 2235 square miles, and the population in 1847 was 608,470. The circle is very hilly, being traversed by branches of the Wasgau (Vosges); but there are some beautiful valleys and plains, which are very fertile and well cultivated. The higher mountains are for the most part covered with forests; the southern slopes with vineyards. The principal river is the Rhine. All the other streams are tributaries to the Rhine; the chief of these are the Lauter, which forms the boundary towards France; the Queich, the Speyerbach, and the Nahe. Agriculture is carried to a high degree of perfection; the products are corn of all kinds, pulse, flax, hemp, tobacco, madder, and hops. Fruit is very extensively cultivated, and the inhabitants derive very large profits from the growth of walnuts and chestnuts. The best wines are produced near the Rhine. There are flourishing manufactures of wool, cotton, and hardware. The chief towns are Deux-Ponts, Landau, Speyer.

RHEIN-PROVINZ (province of the Rhine) sometimes called Rhenish Prussia, though this latter name is more generally understood to include also the province of Westphalia, lies between 49° 10′ and 51° 55′ N. lat., 5° 55′ and 8° E. long. It is situated on both sides of the Rhine, and comprises the grand-duchy of the Lower Rhine, and the duchies of Juliers, Cleves, and Berg. Except the circle of *Wetzlar*, which is encompassed by Nassau, Hesse-Darmstadt, and Hesse-Cassel, it is bounded N. by Westphalia, E. by Nassau and Hesse-Darmstadt, S. by France and Bavaria, and W. by Belgium and the Netherlands.

The northern part is generally flat. The high lands commence on both sides of the river, near Bonn, and extend southward. On the west side of the river is the volcanic district of the Eifel, which contains the lake of Laach. A large part of the course of the Rhine south of Bonn lies between the high lands which come close to the banks of the river. The principal rivers are the RHINE, the MOSELLE, and the Lippe, which are navigable; the many smaller streams, most of which fall into the Rhine, are either not navigable, or only by very small vessels. The climate is temperate; the air on the right bank of the Rhine is pure and healthy; on the left bank damp fogs are more frequent, especially in the north-west part, where there are many marshes; on the mountains it is cold. The natural productions of this province are equally numerous and valuable. Some parts of the mountains are crowned with forests, and the declivities are covered with vineyards where the exposure is favourable. The mineral kingdom yields silver, iron, copper, lead, calamine, marble, slate, freestone, millstones, basalt, porphyry, alum, manganese, sulphur, coal, and salt. In the level parts of the north there are productive corn-fields and rich pastures; between the mountains there are fertile valleys, where flax, hemp, hops, and tobacco are grown, and fruit and garden produce of every kind are cultivated in great abundance. Game is plentiful, and all the domestic animals are bred in sufficient numbers.

The Rhine passes through this province for 180 miles, and is navigated by steamers. On its banks are vestiges of Roman works and ruins of castles of the middle ages. The small rivers and streams are applied to turn mills and to work manufacturing machinery of every kind. The trade of the province is very extensive. The numerous manufactures are named in the articles on the several towns. The province had, at the end of 1846, 41 cotton factories with 109,547 spindles.

The province is divided into 5 governments, which with their area and population are as follows:—

Provinces.	Area in sq. miles.	Pop. in 1847.
Cologne . .	1,532	484,593
Düsseldorf . .	2,080	887,614
Coblenz . .	2,320	499,557
Trèves . . .	2,775	488,699
Aachen . . .	1,601	402,617
Total . .	10,308	2,763,080

Of the population 2,074,153 are Catholics, 658,874 Evangelicals, and 28,388 are Jews. The rest are Mennonites.

The government of Cologne is noticed under COLOGNE. Its chief towns are—COLOGNE, which with Deutz had a population of 95,202 in 1847; and BONN.

The government of Düsseldorf is described under DÜSSELDORF. Its chief towns are—DÜSSELDORF: BARMEN (population in 1847, 32,984): CLEVES: CREFELD: ELBERFELD (population in 1847, 34,956): and several others noticed under Düsseldorf.

Under COBLENZ the government and town of this name are described. The other large towns of this government are—CREUZNACH, and NEUWIED.

The government of Trèves or Trier and its towns are noticed under TRIER.

The government of Aachen and its chief town, which had 46,585 inhabitants in 1847, are noticed under AIX-LA-CHAPELLE. The other towns of the government are—EUPEN: *Düren*, an ancient well-built town with about 8000 inhabitants, who manufacture woollen cloths, fustian, paper, iron, steel, nails, vitriol, &c.: *Burtscheid* [AIX-LA-CHAPELLE]: and Jülich [JÜLICH-CLEVE-BERG.]

A railroad joins Bonn to Cologne, whence it runs through Aix-la-Chapelle and unites the province with the Belgian railway system; and from Deutz a suburb of Cologne on the right bank of the Rhine, another line communicates with Hamburg, Berlin, and other large towns of Germany.

RHEIN-HESSEN. [HESSE-DARMSTADT.]

RHEINGAU. [NASSAU, DUCHY OF.]

RHENA'NUS, BEA'TUS, was born in 1485, at Schlettstadt in Alsace. After the boy had finished his elementary education, his father sent him to Paris, where he studied philosophy and ancient literature. From Paris he went to Strasbourg and Basel, and in the latter place he formed an intimate friendship with Erasmus and Gelenius. During his residence at Paris he had been employed in the office of the learned printer H. Stephens, and he occupied himself in a similar manner in the printing establishment of Froben at Basel.

In 1520 his father died and left him all his property; but Rhenanus continued his favourite study of the ancients. He had always objected to marrying, but at last his friends prevailed upon him, and at the advanced age of 61 he married. He died at Strasbourg on the 20th of May, 1547.

Rhenanus is chiefly celebrated as the editor of many ancient authors, on whom he bestowed great care, with the view of giving a correct text. The following is a chronological list of most of his editions:—'Quintus Curtius,' Basel, 1517; 'Maximus Tyrius,' Basel, 1519; Velleius Paterculus,' Basel, 1520 (this is the editio princeps of that historian); 'Tertulliani Opera,' Basel, 1521; 'Auctores Historiæ Ecclesiasticæ,' containing Eusebius, Pamphilus, Nicephorus, Theodoret, &c., 1523–25 (reprinted at Paris in 1541); 'Plinius, Historia Naturalis,' Basel, 1526; 'Procopius Cæsariensis De Rebus Gothorum,' Basel, 1531; 'Tacitus,' Basel, 1533 (reprinted in 1544); 'Livii Decades Tres,' Basel, 1535.

RHEO'METER. From the Greek words *ῥέω*, *flow*, and *μέτρον*, a *measure*, is an instrument by which the force of an electric, galvanic, or magnetic current may be measured. The word was first proposed by M. Peclet as a synonym for galvanometer; and it has since been employed by Professor Wheatstone in a general sense, together with *Rheoscope*, denoting an instrument by which the existence of an electric, &c. current may be ascertained; and *Rheomotor*, expressing any apparatus, as an electrical or galvanic battery, by which a current of that kind is originated.

The Rheometer or Galvanometer employed by Mr. Wheatstone is a glass cylinder resting on a stand, and containing within it a magnetised needle, which is suspended from the cover. A graduated circle serves to show the deviations of the needle from the zero of the graduations, and the amount of deviation is read by means of a microscope. For forces or resistances which are considerable, there are placed below the circle numerous coils of fine wire; but for small forces a thick plate of wire making but one coil is used.

RHE'TICUS. The real name of this individual was George Joachim. He was born February 16, 1514, at Feldkirch, a small town situated a few miles south of Lake Constance, and was surnamed Rheticus from the circumstance of this part of the Tyrol having been anciently inhabited by the Rhæti. When twenty-three years old he was appointed professor of elementary mathematics in the university of Wittenberg, the higher chair being at that time filled by Reinhold; but after teaching there with some repute for about two years, he relinquished his appointment in order to become the disciple and assistant of Copernicus, whose doctrines he advocated with much zeal and personal risk. His letter to Schöner, entitled 'Narratio de Libris Revolutionum Copernici,' wherein he endeavoured to show that the rotation of the earth about the sun is not a mere probable hypothesis, as Copernicus had thought fit to announce it, but an incontestable truth, and in which he also asserts that if Aristotle himself were living he would be the first to acknowledge his error, excited against him the ill-will of the leading advocates of the Ptolemaic system. He subsequently visited different parts of Germany, taught for some time at Leipzig, and died of apoplexy at Cashau, in the north of Hungary, Dec. 4, 1576. Rheticus computed some trigonometrical tables, works of extraordinary labour.

RHETORIC (*ῥητορικὴ*) is a Greek word of similar import to the Latin oratory; but a rhetorician is a teacher of or writer on oratory, and an orator is one who practises the art; Demosthenes was an orator, Aristotle was a rhetorician, and Cicero was both.

English writers in treating of rhetoric appear generally to consider it the same as oratory, and perhaps it is difficult to make a distinction between them. Cicero's 'Orator,' 'De Oratore,' and 'De Claris Oratoribus,' are always called rhetorical works.

Aristotle begins his work on Rhetoric by saying that rhetoric is the counterpart (*ἀντίστροφος*) of logic, and he defines it to be the faculty (*δύναμις*) of perceiving on any given subject what is best adapted to persuade. He divides rhetoric into three parts: Persuasion (*πίστις*, or rather *πίστεις*), Language or Expression (*λέξις*), and Arrangement (*τάξις*). His work consists of three books, of which the first and second treat of persuasion, and the third treats of expression and arrangement. It is a model of profound thought and critical investigation.

RHEUM (*ῥῆον*), a genus of plants of the natural family of *Polygonaceæ*, which includes the different species of plants which yield the stalks and root so well known by the name of rhubarb.

Long as rhubarb has been known, it is remarkable that the species of Rheum yielding it is yet unknown. This is in consequence of the best rhubarb, Turkey Rhubarb, being only obtained by the Russians at Kiachta from the Chinese.

The different species of rhubarb are important plants, not only on account of the roots being so extensively employed, and so valuable for their medicinal qualities, but also on account of the stalks of the leaves being now so much employed, from their agreeable acidity, in making tarts, &c. As the species are all indigenous in cold parts of the world, that is, from the southern parts of Russia, Siberia, Tibet, the north of China, and the Himalayas, so they may all be grown in the open air of this country, and several are cultivated on account of their stalks. Some also, both in England and France, are cultivated on account of the root, which is sold as Turkey Rhubarb.

The species which are known and cultivated are the following:—

1. *R. Emodi*, Wallich, *R. Australe* of Don, is found in Kumaon; the root is a valuable medicine, though bearing hardly any resemblance to that of the shops.

2. *R. Webbianum*, *R. Emodi* of Meisner, found by Mr. Moorcroft at the height of 12,000 feet above the level of the sea, and by Dr. Royle on the Choor Mountain.

3. *R. spiciforme*, Royle, found on the northern face of the Himalayas. The roots are lighter-coloured and more compact than those of *R. Emodi*.

4. *R. Moorcroftianum*, Royle (Small-Stalked Rhubarb). This species was found by Messrs. Moorcroft and Hearsay near the Niti Pass in the Himalayas, at an elevation of 12,000 feet.

5. *R. leucorhizum*, Pall. (*R. tataricum*, Linn.), a small plant for the genus. The root is white and branched, though said to be equally efficacious with the best sorts.

6. *R. rhaponticum*, Linn. North of the Caspian. According to Guibour, cultivated largely near Lorient, in the department of Morbihan in France, at a place called from that circumstance Rheumpole. *R. rhaponticum, hybridum, compactum*, and hybrid varieties of them, are the common garden rhubarbs.

RHEUM (Rhubarb), *Medical Properties of.* As the particular species which yields the officinal rhubarb, and even the precise place of its growth, are not known, the varieties met with in commerce are here described, without attempting to

assign them to any ascertained species. There are six well-marked varieties, viz. Russian or Turkey, Dutch-Trimmed, Chinese, Himalayan, English, and French. Of the first sort the greater portion at present comes from St. Petersburg, and is denominated Muscovite, Bokharian, or Siberian rhubarb, while a 'part has always formed one of the imports from China into Bokhara, whence passing to Smyrna, it is known in Europe as Turkey Rhubarb' (Royle, 'Flora of the Himalaya'), which name it commonly bears in the shops. This kind varies much in size and appearance, the pieces being cylindrical, spherical, flat, or irregular, from two to three inches long, one to three broad, and one to three thick. 'The smaller pieces are picked out, being preferred, while the larger pieces and the dust are employed for powdering.' Holes are remarked in many of the pieces, of which one occasionally extends entirely through, the others only partially; the former having been made in order to suspend the piece in drying, the others in examining the quality. This kind, and probably the other sorts, is frequently worm-eaten, owing to the ravages of a small beetle, *Sinondendrum pusillum*. (Kirby and Spence's 'Entomology,' i., p. 252.)

The analysis of this sort shows it to consist of—

Rhubarberine, or Bitter Principle	16
Yellow Colouring Matter	9
Bitter Extractive	14
Oxidized Tannin	1
Mucilage	10
A substance extracted from the woody fibre	28
Oxalic Acid	1
Woody Fibre	14
Moisture, Loss, Odorous Principle	3

Dutch-Trimmed Rhubarb, called also by some writers Persian Rhubarb, and Batavian, occurs in flat or round pieces, and is not much different in appearance from the preceding, but it reaches Europe through Canton and Singapore.

Chinese or East Indian Rhubarb, termed in commerce *half-trimmed* or *untrimmed* rhubarb, rarely presents an angular character, but occurs in rounds or flats. 'The best pieces are heavier and more compact than those of the Russian kind, and the odour is much less powerful and less aromatic.'

Himalayan Rhubarb is not known as a commercial article in this country, nor is it even an article of large consumption in India, where it sells for only one-tenth of the best rhubarb, resembling in quality the Russian, and which is found in India.

English Rhubarb occurs in two states, '*dressed* or *trimmed* so as to resemble the Russian kind, and *stick* rhubarb. The first is grown at Banbury in Oxfordshire, and is frequently used for the show-bottles in druggists' windows, and often sold in the streets of London for Turkey Rhubarb, by persons dressed up as Turks. Stick Rhubarb is sold in the herb shops, and is in long pieces.'

French Rhubarb is not brought into this country.

Rhubarb presents the peculiarity of producing two opposite effects, according to the dose exhibited. In small doses it is tonic and astringent, in large doses purgative, but generally followed by constipation.

RHEUMATISM (from *ῥευματισμὸς*, 'a defluxion'). *Acute Rheumatism* is also called Rheumatic Fever. 'This disease,' says Sydenham, 'happens at any time, but especially in autumn, and chiefly affects such as are in the prime of life. It is generally occasioned by exposing the body to the cold air immediately after having heated it by violent exercise or some other way. It begins with chilliness and shivering, which are soon succeeded by heat, restlessness, thirst, and the other concomitants of fever. In a day or two, and sometimes sooner, there arises an acute pain in some or other of the limbs, especially in the wrists, shoulders, knees; which shifting between whiles affects these parts alternately, leaving a redness and swelling in the part last affected. In the beginning of the illness the fever and the above-mentioned symptoms do sometimes come together, but the fever goes off gradually, while the pain continues and sometimes increases.' Acute rheumatism varies considerably in intensity and duration; the patient may have considerable fever, and severe pain in nearly every joint, so as to render him perfectly helpless; or the fever may be slight, and the local inflammation limited to one or two joints. There is not always a relation between the severity of the local symptoms and the constitutional disturbance. The duration of this disease depends on the mode of treatment; it may be terminated in a few days, or may endure as many months; in nearly every case the general symptoms cease before the local inflammation is stopped. Acute rheumatism simply is seldom if ever a fatal disease, but complicated with Pericarditis, Endocarditis, or Pleurisy, it is highly dangerous. With respect to what is called *Chronic Rheumatism*, it may be either a continuance of acute rheumatism in a milder form, or may originate in this chronic, or, more properly speaking, subacute character. Dr. Elliotson has distinguished chronic rheumatism into hot and cold: in the former, the joints affected are above the natural temperature of the other parts of the body, and are relieved by the application of cold; in the latter, the contrary is the case. Whether the pain of the joints is relieved most by hot or by cold applications, it is generally aggravated in cold moist weather, and diminished during an opposite condition of the atmosphere. The only diseases with which rheumatism can be confounded are gout and periostitis.

With respect to the causes of rheumatism, it is now generally agreed that it depends upon a disordered condition of the blood, frequently traceable to improper diet and exposure to cold. Some persons appear to be hereditarily more exposed to it than others. In all cases the disease is attended with the excretion of a large quantity of acid matter from the system.

The treatment of rheumatism must chiefly have reference to the constitutional nature of the disease. Blood-letting, colchicum, the iodide of potassium, the alkalies and alkaline carbonates, with calomel and opium, according to circum-

stances, are the chief remedies employed in this disease.

RHIN, BAS, a department of France, formed out of Lower Alsace and a portion of German Lorraine, takes its name from its position on the Rhine. It is bounded N. by the department of Moselle and the Bavarian Palatinate, E. by Baden, from which it is separated by the Rhine; S. by Haut-Rhin, S.W. by the department of Vosges, and W. by that of Meurthe. Its greatest length is 68 miles; the greatest breadth about 55 miles. The area is 1782 square miles, and the population in 1846 was 580,373, which gives 325.68 inhabitants to a square mile, being 151.93 above the average per square mile for all France.

The west of the department for a breadth of 6 to 10 miles is occupied by the rugged woody highlands, which form the eastern face of the Vosges Mountains. The mountain sides are diversified with precipitous rocks, and picturesque valleys watered by small streams, which flow ultimately into the Rhine, except a few that join the Sarre. The mountains, which have a mean height of about 2300 feet, but rise at points to 4777 feet, are composed of sandstone, limestone, and marl. From the eastern foot of the Vosges, a rich tract forming about two-fifths of the whole surface of the department, extends with gentle slope to the bed of the Rhine. The immediate banks of the river are in many places marshy.

The department belongs entirely to the basin of the Rhine, which in this part of its course is studded with islands. The Rhine yields abundance of trout, perch, salmon, carp, sturgeons, and eels. Some particles of gold are brought down by the current. The *Ill*, which rises in Haut-Rhin, near the Swiss frontier, and flows northwards parallel to the Rhine and a few miles west of it, receiving the mountain-streams of the Vosges, has nearly 40 miles of its course in this department, and through the whole of that distance it is navigable. It joins the Rhine a few miles below Strasbourg. The Zorn, the Moder, the Surbach, the Seltzbach, and the Lauter, all flow from the eastern face of the Vosges into the Rhine. Of these, the Moder alone is navigable, and that for only two miles. The others are used for floating timber down from the mountains. The Sarre, a feeder of the Moselle, which is itself a tributary of the Rhine, flows within the department for about 20 miles, 10 of which are navigable. There are several navigable canals. The most important is the great canal that joins the Rhône and the Rhine, formerly called Canal-de-Monsieur. This canal enters the department on the south side from the adjacent department of Haut-Rhin, and, running northward along the valley of the Rhine, opens into the Ill just above Strasbourg. The Bruche canal commences near the junction of the Mossig with the Bruche, and follows the valley of the Bruche River to its junction with the Ill. Including the Rhine, which is navigable along the east boundary of the department, the internal navigation extends over a length of about 200 miles. The department is traversed by 7 national and 32 departmental roads; also by the Strasbourg-Basel and the Paris-Strasbourg railroads.

The soil of the mountains is rocky, and in a great degree barren; that of the immediate bank of the river is marshy, but the flat which occupies the intervening space is rich and highly cultivated. The department produces corn of all kinds in quantity more than enough for the consumption. Wheat is the chief grain crop; spelt wheat is extensively grown in the north; rye also is an important crop; oats is but little grown except on the highlands. Madder and tobacco are objects of careful cultivation in the valley of the Rhine; about 25,000 acres of the best soils are under tobacco culture. Excellent hemp is grown. From cabbages, which are extensively cultivated and grow to an enormous size, a great quantity of *choucroute* or sauer-kraut is made for export to Strasbourg and Germany. Among other productions must be named oleaginous seeds, onions, beans, hops, and gentian. Great quantities of large plums for preserving are grown; and also cherries, from which excellent kirschwasser is made. About 11,000,000 gallons of wine are produced annually, one-half of which goes to the home consumption, the rest is exported to the right bank of the Rhine. There is a great breadth of meadow land in the department. Horses and cows are very numerous, and of good breed: both oxen and horses are employed in agriculture. The number of sheep is comparatively small. Swine are reared in great numbers; and also geese, the livers of which are used in making the famous Strasbourg pies. The woodlands are very extensive; considerable part of the timber is formed into small rafts, and floated down the Rhine to Mainz, where they are united, so as to constitute enormous rafts from 250 to 300 yards long, and 25 to 30 yards broad, conducted each by 300 or 400 men.

Iron ore is very abundant: 28 mines are worked. Lead, antimony, manganese, and some traces of silver are found. Coal mines are worked. Building stone, plaster of Paris, potters' clay, slates, and asphalte are quarried. Pebbles, admitting of a fine polish, are found in the Rhine. The department contains several mineral springs.

The industrial products are very important and numerous; they comprise fine woollen cloths, linen, calico, sailcloth, cordage, straw hats, playing cards, room paper, hair brushes, horn combs, mineral acids, oils, soap, ivory black, ironmongery, hardware, saw-blades and tools of all kinds, fire-arms, swords and surgical instruments, gloves, buff leather and dressed skins, paper, &c. There are numerous madder mills, paper mills, potteries, bleach works, breweries, tan-yards, cannon foundries, and 27 iron forges and furnaces. About 115 fairs are held in the year.

The climate of the department is on the whole temperate; but the winters, owing to the snow lying so long on the Vosges, are long; the heats of summer, which succeed the winter almost immediately (for the springs are very short) are often disagreeably varied by sudden chills; the autumn is invariably long and fine. The prevailing winds blow from the south and north-east.

Among the remarkable valleys that lie between the offshoots of the Vosges, must be named the Katzenthal, in which several mines are worked; the Jagerthal, studded with iron furnaces and forges; the valley of Niederbronn, famous for its mineral waters; the Barenthal, with its numerous factories; the Kronthal, with its vast quarries; the valley of Barr, the road through which is lined with an almost continual succession of houses and workshops; and the Klingenthal and the valley of the Bruche, which abound in picturesque sites.

The department contains 1,148,540 acres distributed among 223,019 proprietors, and into 2,531,368 parcels. Of this area 447,079 acres are under the plough; 138,952 acres are meadow and grass land; 32,429 are laid out in vineyards; 290,987 acres are covered with woods and forests; 14,639 acres are occupied as orchards and gardens; and 49,410 acres consist of moor and mountain pasture.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows :—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Strasbourg . .	12	161	237,944
Saverne . . .	7	165	110,477
Schélestadt .	8	114	137,131
Weissembourg.	6	104	94,821
Total . .	33	544	580,373

Of the arrondissement of Strasbourg and of the whole department, STRASBOURG is the capital. *Bischwiller* is prettily situated on the Moder, a feeder of the Rhine, 13 miles N. from Strasbourg, and has 5721 inhabitants. The town formerly gave title to a bishop and was fortified, but the defences were dismantled in 1706. Cloth for soldiers' uniform, linen, cutlery, worsted gloves and stockings, oil, earthenware, beer, woollen yarn, and leather are manufactured. There are also bleachworks and madder mills; turf and iron ore are raised in the neighbourhood. The trade in these articles and in wine, hemp, tobacco, hops, cattle, &c. is considerable. *Brumath* or *Brumpt* on the Zorn, which is said to occupy the site of the ancient *Brocomagus*, a town of the Tribocci, has a population of 3761. *Geispolsheim* or *Geispitzen*, the first station out of Strasbourg on the railroad to Basel, has tileries, brick-kilns, and 2142 inhabitants. *Hagueneau* or *Hachneau*, a pretty fortified town, stands N. of Strasbourg on the Moder, and has a college, a consultative chamber of manufactures, and 10,349 inhabitants. The town was surrounded with walls in 1154 by the emperor Frederic I., who deposited here the crown, sceptre, sword, and other imperial relics of Charlemagne, which were carried away by the Bishop of Speyer in 1219. The churches of St.-Georges and St.-Nicolas, which date respectively from the 12th and 13th centuries and are richly decorated, the cavalry barracks, and the hospital, are the most remarkable buildings. Calico, soap, pitch, beer, pottery, starch, cotton and hempen yarn, and leather are manufactured. Hops are cultivated extensively in the neighbourhood. The trade of the town is in these articles, and in wood, wool, ground madder, &c. *Molsheim*, W. by S. from Strasbourg, is situated on the Bruche, at the foot of the Vosges Mountains. The town, which is prettily built, and has a remarkable church, contains 3333 inhabitants, who manufacture tape, swords, files, scythes, hardware, cutlery, &c. *Mutzig*, a pretty little walled town, with 3424 inhabitants, stands in the valley of the Bruche, which is strewed with villages and factories. The old chateau of the bishops of Strasbourg is now a manufactory of fire-arms. Mutzig is the birthplace of the mathematician Arbogast. *Wasselonne*, situated W. of Strasbourg on the Mossig, at the entrance of the Kronthal, has a population of 4300, and manufactures of woollen hosiery, cotton handkerchiefs, soap, woollen yarn, paper, leather, &c. There are bleach-works and important stone-quarries near the town.

Of the arrondissement of Saverne, the chief town is *Saverne*, an irregularly-built place N.W. of Strasbourg, on the Paris-Strasbourg Railway, with a tribunal of first instance, a college, and 5226 inhabitants. The town, which stands on the Zorn, was formerly the residence of the Prince-bishops of Strasbourg. The episcopal palace, now converted into barracks and a prison, and the parish church, which is surmounted by a massive square tower five stories high and of great antiquity, are the most remarkable buildings. The environs of the town abound in picturesque sites. Broad cloth, hosiery, iron castings, copper ware, beer, leather, tiles, and bricks, are among the industrial products. A good deal of wood is floated down the Zorn. *Bouxwiller*, a small manufacturing town in a charming situation, at the foot of the Vosges and on the right bank of the Moder, 8 miles N.E. from Saverne, has a population of 3566. Coal and iron mines are worked near it. Chemical products, hardware, leather, beer, ropes, copper-ware, linen, &c. are manufactured. *Hochfeld*, E. of Saverne, and further down the Zorn, is situated in a fertile district, and has madder and plaster-mills, and 2503 inhabitants. *Marmoutier* or *Mauermunster*, situated at the foot of the Vosges, 4 miles from Saverne, owes its origin to a monastery founded by Childebert II. The church, part of which dates from the ninth century, has been classed among the historical monuments of France. The population numbers 2555. *Saar-Union*, 15 miles N.W. from Saverne, stands on the Saar or Sarre, which divides it into two parts—Bourquenom and Saarwerden—united by a bridge. The population amounts to 4257, and manufacture broadcloth, linen, stockings, hats, beer, tiles, and bricks.

Of the arrondissement of Schélestadt, the chief town *Schélestadt*, is situated on the left bank of the Ill, 27 miles from Strasbourg by the Strasbourg-Basel Railway, which has a first-class station here. The defences of the town, built by Vauban, form a regular octagon, flanked with bastions and enclosed by fosses, which are filled by the waters of the Ill, and have their sides planted with poplars.

The entrance to the town is by 3 gates; the Strasbourg gate is reached by a fine avenue of poplars. The interior consists of narrow, crooked, and irregularly-built streets. The supply of water is from pumps and from canals that run through the principal streets, turning several mills in their course. The principal structures are—the churches of St.-Georges and Sainte-Foy; the Pavillon, a large building which formed part of the monastery of Sainte-Foy, erected by Hildegarde, duchess of Suabia, in 1094, now converted into officers' barracks; the court-house, once a Jesuit college; and the Fausse-Porte, a large vaulted arch, supporting a square clock-tower, said to be a part of the ancient fortifications. Schélestadt also possesses an ancient Recollet church, now used as a military storehouse; large barracks, a prison, a town-house, an hospital, an arsenal, a college, a tribunal of first instance, and 8634 inhabitants, who manufacture wire blinds, pottery, tobacco, potato-starch, vinegar, leather, beer, flour, &c., and trade in corn, wine, fruits, and other agricultural produce. *Barr*, at the foot of the Kirchberg, 9 miles N. from Schélestadt, is situated among vine-clad hills, and is a well-built town, with 4288 inhabitants. It has oil and tan mills, mills for grinding dye-stuffs, dye-houses, and cotton mills driven by water; woollen hosiery and glue are also manufactured. Near Barr is the *Hoenburg*, one of the most remarkable mountains of Alsace for its situation and antiquities; among the latter is an immense wall, supposed to be of Roman erection, enclosing a circuit of 6 miles, and several ruined castles and monasteries. *Benfeld*, a station on the Strasbourg-Basel Railway, 10 miles N. from Schélestadt, is prettily situated on the Ill, in a district of great fertility, and has 2688 inhabitants. This town is in the centre of the tobacco culture, and has manufactures of cotton yarn, leather, tiles, bricks, beer, and pottery. *Erstein*, 14 miles N. by railway from Schélestadt, is also situated on the Ill, and has tanyards, bleach-works, tileries, and 3445 inhabitants, who also grow tobacco. *Marckolsheim*, 8 miles S.E. from Schélestadt, is situated on the Ichert and on the canal du-Rhône-du-Rhin, near the left bank of the Rhine, and has a population of 2327, who manufacture linen, soap, earthenware, tiles, &c., and trade in tobacco and hemp. *Obernai*, a little walled town entered by 4 gates, ill built, but prettily situated at the foot of the Hohenbourg, on the Ehnheim, from which circumstance it takes its German name of *Oberehnheim*, has a population of 4898. The town, which formed the sixth of the ten free imperial towns of Alsace, has an hospital, a town-house, erected in 1523, cotton mills, and brandy and kirschwasser distilleries. *Rosheim*, another of the ten imperial free towns, is situated in a beautiful valley among the Vosges, on the Magel, the waters of which are made to circulate through the streets. It is girt with a wall, which is flanked with towers, and pierced by three gates. Two turreted gates, situated in the interior of the town, divide it into three parts. The church of St.-Pierre, in the lower town, the church of St.-Pierre-et-St.-Paul, in the middle town, the town-hall, the hospital, and the two mineral bath establishments, are the most remarkable buildings. The population amounts to 3502; the principal industrial occupations are the weaving and bleaching of cotton. *Villé* or *Weiler*, a small place of about 2000 inhabitants, is situated in the midst of a coal district, surrounded by the wooded heights of the Vosges.

In the arrondissement of Weissembourg, the chief town *Weissembourg*, or *Wissembourg*, is situated on the Bavarian frontier, on the left bank of the Lauter, and has a tribunal of first instance, a college, and 6184 inhabitants, who manufacture hosiery, straw hats, soap, potash, pottery, beer, bricks, &c., and trade besides in brandy, tobacco, and asphalte. The town is surrounded by ramparts, which form an agreeable public walk; it is pretty well built. The most remarkable structures are the collegiate church, rebuilt in 1288, the townhall, the barracks, the tower of Mitteltburn, which serves for a prison, and the Protestant church of St.-Jean, in which is a bust of Luther. Wissembourg was ceded to France by the treaty of Westphalia; it has suffered great disasters from sieges. A rampart, flanked by a ditch, extends from this town to Lauterbourg, forming what are called the lines of Wissembourg, which were carried by the Austrians in 1793. *Lauterbourg*, a fortress of the fourth class, 12 miles E. from Wissembourg, and the most eastern town in France, is situated on the Lauter, and near its confluence with the Rhine. The town has 2459 inhabitants. *Seltz*, a few miles S. of Lauterbourg, stands on the left bank of the Rhine, which here receives the Seltzbach. This town, which occupies the site of the ancient *Saletio*, has 2180 inhabitants, who manufacture oil and cotton yarn, and trade also in hemp and flax. *Soultz-sous-Forêts*, half way between Wissembourg and Haguenau, has salt-springs, iron, asphalte, and coal-mines, and about 2000 inhabitants. *Niederbronn*, 16 miles S.W. from Wissembourg, is built at the opening of a valley, whence a gorge leads out of Alsace into Lorraine. It consists of two wide streets lined with houses and gardens. The situation is most healthy; in the centre of the town are two mineral springs, which have been famous since Roman times. The waters are drunk, and also used for baths, which may be had at various parts of the town. The population amounts to 2922; the industrial establishments include iron furnaces and forges, paper-mills, tanyards, and breweries. The neighbourhood abounds in pretty mountain scenery.

The department, together with that of Haut-Rhin, forms the see of the Bishop of Strasbourg; it is included in the jurisdiction of the high court of Colmar and of the University Academy of Strasbourg, and belongs to the 4th Military Division, of which Strasbourg is head quarters. Under the late monarchy it returned 6 members to the Chamber of Deputies; it now has 12 representatives in the Legislative Assembly of the Republic.

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RHIN, HAUT, a department of France, formed out of Upper Alsace, the Suntgau, and the former republic of Mühlhausen, is bounded N. by Bas-Rhin; E. by Baden, from which it is separated by the Rhine; S. by the Swiss canton of Berne; S.W. and W. by the departments of Doubs, and those of Haute-Saône and Vosges. Its greatest length from N. to S. is about 60 miles; from E. to W. about 40. The area is 1567.75 square miles, and the population in 1846 was 487,208, which gives 310.719 inhabitants to the square mile, being 136.969 above the average per square mile for the whole of France.

This department, like that of Bas-Rhin, is included between the crests of the Vosges on the west and the banks of the Rhine on the east; its western side is consequently mountainous, while on the east it subsides into the valley of the Rhine. The Vosges Mountains are remarkable for the number of dome-shaped summits that occur on the main ridge; these are called from their form *Ballons*. The Ballon of Guebwiller, or Soultz, the highest point in the Vosges, is noticed below.

The department belongs chiefly to the basin of the Rhine. The Rhine has a considerable breadth, and an average depth of ten to twelve feet. The numerous islands in the channel are a serious obstruction to the navigation. The various streams which flow from the Vosges are received by the Ill. [RHIN, BAS.] The navigation of the Ill commences at its junction with the Lauch, close to Colmar; but it is used for floating timber above that point. The Lauch and the Fecht, which join the Ill, are used for floating timber. The Largue, which rises in the Jura, has been made a feeder of the canal du-Rhône-au-Rhin. The south-west of the department belongs to the basin of the Rhône, and is drained by the Halle, the St.-Nicholas, and the Savoureuse, which fall into the Doubs. None of these rivers are navigable.

The canal du-Rhone-au-Rhin enters the department near the junction of the little rivers Halle and St.-Nicholas, and runs north-east along the valley of the St. Nicholas to its summit level near Dannemarie; from thence it runs still north-east partly along the valley of the Ill to the basin near Mühlhausen, from whence a branch proceeds to join the Rhine at Huningue near Basel, while the main branch runs northward between the Ill and the Rhine into the department of Bas-Rhin. The total navigation of this canal, of the Rhine, and the Ill, within the department, amounts to 131 miles.

The department is traversed by 7 national and 15 departmental roads; and also by the Strasbourg-Basel Railway, which passes through Colmar and Mühlhausen, whence a branch runs to Thann.

The soil of the department is stony and barren along the bank of the Rhine and in the Vosges; the central part between the Vosges and the left bank of the Ill is more fertile; the district formerly called *Suntgau*, of which Belfort was the capital, ranks next to this central region in fertility. The region betwixt the Ill and the Rhine contains extensive forests. The climate resembles that of Bas-Rhin, but it is rather more changeable, and the winters are rather longer. The products are similar to those mentioned in the preceding article, and more than suffice for the consumption, though formerly this was not the case. The annual vintage yields about 12,760,000 gallons, of which a considerable surplus above the home supply is exported to Switzerland and Germany. A large quantity of kirschwasser is also made. The domestic animals are similar in kind and in number to those of Bas-Rhin; but goats are much more numerous. Even amid the mountains there are some very productive valleys. Cultivation is carried on with great care. The abundant supply of wood in the Vosges Mountains furnishes fuel for the various manufactures of the department. It is floated down the streams which flow into the Ill or the Doubs.

Silver, copper, and lead are found; a great number of iron mines are worked; also mines of antimony, coal, and asphalte; rock-crystal, marble, porphyry, granite, building stone, gypsum, potter's clay, marl, ochre, &c., are quarried. There are mineral springs in several localities.

The industrial products are of the most varied description, the department being one of the most active seats of the cotton manufacture in France; they comprise calicoes and printed cottons of all descriptions, shawls, handkerchiefs, hosiery, fine woollen cloths, flaxen and hempen fabrics, ornamental paper, straw hats, chemical products, soap, leather of all kinds, ironmongery, iron wire, clock and watch movements, pottery, &c. There are also numerous cotton, thread, and woollen yarn factories; dyehouses; sugar-refineries; establishments for distilling spirits from pressed grapes, corn, cherries, gentian, potatoes, and carrots; iron furnaces and forges, paper-mills, breweries, tanyards, potteries, and glass works.

The chief articles of commerce are the leading industrial products, together with wine, corn, spirits, kirschwasser, steel, bar-iron, iron castings, watch and clock movements, fruit trees, cattle, &c. About 155 fairs are held yearly.

The department contains 1,003,363 acres, distributed among 171,551 proprietors, and into 1,673,077 parcels. Of this area 384,438 acres are under the plough; 129,898 are meadow and grass land; 27,531 acres are under vines; 336,258 are covered with woods and forests; 14,636 are occupied as orchards and gardens; 70,764 are heath and moorland; 13,255 are covered with waters, canals, and ponds; and 22,581 acres with streets, roads, and buildings.

The department is divided into 3 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Colmar . . .	13	142	208,698
Altkirck . .	6	160	148,274
Belfort . . .	9	191	130,236
Total . . .	28	493	487,208

Of the arrondissement of Colmar and of the whole department, COLMAR is the capital. *Ensisheim*, formerly the capital of Upper Alsace, is situated on the right bank of the Ill, at the point where the canal of Neuf-Brisach joins that river, 15 miles by railway S. from Colmar, and has 3747 inhabitants. The town is surrounded by walls and ditches, and is pretty well built. The town-hall, a vast gothic building; the Jesuit college, now made a central prison for 8 departments; and the parish church, are the most remarkable buildings. An enormous aërolith, which fell near the town in 1492, long kept in this church, has been transferred to the museum of Colmar. *Guebwiller*, a walled town, entered by 3 gates, is situated 15 miles S.W. from Colmar, on the Lauch, and at the foot of the Ballon of Guebwiller, the base of which is covered with rich vineyards. The town, which is well built and distinguished for its manufacturing activity, has a population of 3882. Ribands, cotton cloths, printed calicoes, fine sewing cotton, mill machinery, refined sugar, and chemical products, are among the industrial products. The dome-shaped mountain, called *Ballon de Soultz* or *Ballon de Guebwiller*, which is the culminating point of the Vosges Mountains, is situated within 4 hours of Guebwiller, and reaches the height of 4701 feet above the sea. It is of easy ascent; the view from its summit is very extensive, and of a most varied description, including the richly-cultivated valley of the Rhine with its numerous towns and villages, the forests and gorges of the Vosges, and the mountains and ice-fields of Switzerland. On the northern flank of this mountain there is a lake of considerable size and great depth, which swelled to an unusual height in 1740 by rains and melted snow, burst its funnel-shaped inclosure, and swept with destructive violence all through the valley of the Lauch. *Kaysersberg*, founded by the Emperor Frederic II., is situated on the Weiss, a feeder of the Ill, 6 miles N.W. from Colmar, and has 3138 inhabitants, who manufacture cotton, flaxen, and hempen fabrics, and leather. *Sainte-Marie-aux-Mines* or *Mariakirche*, a bustling, manufacturing town, situated on the Liepvrette, 18 miles N.W. from Colmar, extends along a valley shut in by wooded mountains, and has 11,429 inhabitants. The town is very well built, and extends along both banks of the Liepvrette for a mile and a quarter—the part on the left bank being in Lorraine, that on the right in Alsace. It takes the distinctive part of its name from the mines of silver, copper, and lead near it, which were worked from very ancient times till the middle of the 18th century: only one of them—the lead mine of Surlatte—is now worked; it is joined to the town by a railroad. The industrial products comprise cotton fabrics of every description, but especially coloured cloths and hosiery; also broadcloth, handkerchiefs, neck-ties, woollen and cotton yarn, &c. The town has also several dyehouses, tanyards, fulling and paper-mills, a council of Prud'Hommes, and a consultative chamber of manufactures. *Münster*, a small manufacturing town with a Lutheran church and 3350 inhabitants, stands at the foot of the Mönchsberg on the Fecht, 12 miles S.W. from Colmar. Outside the eastern gate of the town there is a large cotton factory, the machinery of which is driven by water, conducted in an aqueduct from the Fecht. *Neuf-Brisach*, a small but strongly-fortified town of 2432 inhabitants, is situated on the Neuf-Brisach Canal, 9 miles E. by S. from Colmar, and 2½ miles from the Rhine. The ramparts form a regular octagon; they are pierced by 4 gates leading into the four principal streets, which are straight and abut on a central square surrounded by rows of trees. The houses are all of uniform construction; their deficiency in height prevents them from being seen from the outside of the ramparts. On the bank of the Rhine there is a custom-house and a fort. The fortress of Neuf-Brisach was built by Louis XIV. to counterbalance that of Vieux-Brisach, on the Baden side of the Rhine, which he lost at the peace of Ryswick. *La Poutroye* or *Schnierlach*, situated on the Wess, which springs from the lake Blanc, at a little distance, has 2631 inhabitants, who manufacture cotton cloth and yarn. *Ribeauvillé* or *Rappoltzweiller*, a manufacturing town of 7295 inhabitants, is situated 8 miles by railway N. from Colmar, at the opening of a pretty valley, shut in by the lower vine-clad slopes of the Vosges, higher ridges of which, rising in the background, present the ruins of several ancient castles. The town, which was founded in the seventh century, is walled in, and entered by 4 gates. On the highest part of it formerly stood the Château du Prince, which was demolished in 1819, and replaced by a handsome church. The town-hall, which stands in the centre of the town, is a goodly structure. Outside of the lower gate is the Herrengarten, a pretty public walk. *Rouffach*, 8 miles by railway S. from Colmar, on the Lauch, is a walled town of 3349 inhabitants, who manufacture calico, cotton yarn, and plush for hats. The remarkable buildings are the gothic church St.-Valentin and the ancient castle of Isenbourg, which stands on a hill in the centre of the town, and was the residence of several of the Merovingian kings. *Soultz*, a pretty, well-built, walled town, entered by 3 gates, is situated S.S.W. of Colmar, on a small feeder of the Lauch, and has 3449 inhabitants. The town-hall, and the parish church, which is surmounted by an elegant spire, are the most notable structures. On a rock near this town is the castle of Jungholz. The industrial products of Soultz are ribands, hosiery, woollen cloth, leather, and paper. *Wintzenheim*, 5 miles W. from Colmar, has a population of 3534.

The arrondissement of Altkirk takes its name from its administrative capital *Altkirk*, a small town situated on a height above the Ill, near the forest of Hart, 36 miles S. from Colmar, and has a tribunal of first instance, a college, and 3207 inhabitants. The town is divided into two quarters, called the upper and lower town, which are separated by a ditch and the ruins of a castle, formerly the residence of the dukes of Austria during their stay in Alsace. *St.-Louis* and *Habsheim*, two small places of under 2000 inhabitants each, are on the railway from Basel to Mühl-

hausen; at the former, the luggage of passengers is examined by the French custom-house officers. *Mühlhausen* has been already noticed under MÜHLHAUSEN.

The arrondissement of Belfort is named from its chief town *Belfort* or *Béfort*, which is situated in the south-west of the department, 40 miles S.S.W. from Colmar, on the left bank of the Savoureuse, a tributary of the Doubs, and has tribunals of first instance and of commerce, a college, and 7407 inhabitants. When the town was ceded by Austria to the French in 1648, the castle situated on a rock, and hence called La Roche de Belfort, was strengthened by Vauban, who also surrounded the old town with walls, which are flanked with towers and bastions, and entered by 3 gates. Within the circuit of these walls, which inclosed a much larger space than the site of the old town, a more modern town has been erected, with strait wide streets of neatly-built houses. The most important buildings are the parish church, the town-house, and the barracks. The town has extended beyond the walls, and there are now three handsome suburbs. Belfort ranks as a fortress of the second class. Clock movements, wax candles, hats, tin ware, and leather are manufactured; there are also breweries, iron forges, and iron wire factories. Corn, wine, brandy, and kirschwasser also enter into its commerce. *Cernay*, N.N.E. of Béfort, on the railway from Mühlhausen to Thann, stands on the left bank of the Thur, and has 3433 inhabitants, who manufacture printed calicos, cotton yarn, paper, and iron. *Girormagny*, a town of 2247 inhabitants, stands on the Savoureuse, 7 miles N.N.W. from Béfort, at the foot of the Vosges, in a district that contains copper, lead, cobalt, and zinc, but no mines are worked. Hosiery, calico, cotton yarn, tiles and bricks are made. *Massevaux*, in a pretty situation on the right bank of the Doller, 11 miles N.N.E. from Béfort, has iron forges, cotton factories, and a population of 3244. *St.-Amarin*, situated in a valley of the same name, near the left bank of the Thur, has iron forges and smelting furnaces, and 2000 inhabitants. *Thann*, on the Thur, at the opening of the valley of St.-Amarin, is 16 miles N.E. from Béfort, and has 5742 inhabitants. It is built at the foot of a mountain crowned by the ruined castle of Engelbourg, and is joined to the Strasbourg-Basel railroad by a branch line to Mühlhausen, from which it is 13 miles distant. The town is pretty well built, and has a magnificent church dedicated to St.-Thibaut, which was founded in 1430, and constructed on the same plan as Strasbourg cathedral. The beautiful pyramidal spire of this church rises to the height of 328 feet: it was not completed till 1516. Thann is a busy manufacturing place, numbering among its products longcloths, hosiery, cotton handkerchiefs, chemical products, spinning machinery, cotton yarn, and pig and bar iron.

The department, together with that of Bas-Rhin, forms the see of the bishop of Strasbourg. It is included in the jurisdiction of the High Court of Colmar, and of the University-Academy of Strasbourg; and belongs to the 4th Military Division, of which Strasbourg is head-quarters. Under the monarchy it returned 5 members to the Chamber of Deputies; it now has 10 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850.)

RHINACANTHUS (from ῥὶν, a snout, and ἄκανθα, a thorn), a genus of plants belonging to the natural order *Acanthaceæ*.

R. communis is a native of the continent of India. The roots, in conjunction with lime-juice and pepper, are used as an external application for ringworm.

RHINANTHUS (from ῥὶν, a snout, and ἄνθος, a flower), a genus of plants belonging to the natural order *Scrophulariaceæ* of Jussieu, and the type of the order *Rhinanthaceæ* of De Candolle. The species are annual plants, inhabiting marshes, and confined in their geographical distribution to Europe.

R. crista-galli, Cockscomb, or common Yellow Rattle; has the name of Yellow Rattle from the colour of its flowers, and the rattling noise made by the seeds in the capsule when ripe. On this account the fruits are called Rattle-Boxes in Ireland. In some parts of England this plant is known by the name of Pennygrass, and in Yorkshire it is called Henpenny, from the seed-vessels resembling in shape and size a silver penny. The term Cockscomb has been applied to this plant from the fringed appearance of the bracts which surround the flowers. The seeds of a species of Rhinanthus were at one time used in infusion for destroying vermin in bedsteads and furniture.

RHINE (in German, *Rhein*). This river is, in respect of length, the fourth of European rivers, being inferior to the Volga, Danube, and Dnieper; but as a channel of commerce, it is certainly the first river of continental Europe. It rises in the Alps of Switzerland, in several parts of its course separates that country from Germany, afterwards divides Germany from France, traverses the territories of several princes belonging to the German Confederation, and lastly it drains the plains of Holland, where it reaches the sea by several arms. That portion of the river which lies within or along the boundary-line of Switzerland is called the Upper Rhine; from Basel to Cologne it is denominated the Middle Rhine; and the remainder of the course, to its several mouths, the Lower Rhine.

Upper Rhine.—The river originates in three branches, called the Vorder-Rhein, Mittel-Rhein, and Hinter-Rhein, in that elevated chain of the Alps which runs eastward from the mountain-road of St. Gothard through Graubündten, or the country of the Grisons. After their junction, near Chur, the river is nearly 250 feet wide, its waters having been increased by numerous small tributaries. From Chur to Basel it is navigated in parts by rafts and small flat river-boats, and it begins to run through a valley from one to two miles wide, in a nearly northern direction towards the Lake of Constanz. Where the river enters the Lake of Constanz it runs through a swampy tract of small extent. The river issues from the

lake at Constanz, which is 1344 feet above the sea-level, and flowing in a western direction for a few miles, enters the Unter-See or Lower Lake. Below Schaffhausen the Rhine rushes over a rock which is between 65 and 70 feet high. The river is further interrupted by a cataract at Laufenburg and by a rapid at Höllenhacken. Numerous tributaries join the Rhine in its upper course above Basel, but none of them are navigable or otherwise remarkable, with the exception of the Aar. [AARGAU.]

Middle Rhine.—At Basel, where this division of the river begins, it has entirely left the mountain-region of the Alps and Jura Mountains, and at the same time it changes its western into a north-north-eastern and northern course. The inclination becomes considerable, and the stream rapid. In addition to the great rapidity of the current, the wide bed of the river contains numerous sand-banks and small islands, which are subject to sudden and frequent changes in their form and position. Navigation in this part of the Rhine is accordingly limited. As the river advances northward, the rapidity becomes less, and the islands fewer. It passes Strasbourg, Mannheim, and Mainz. Below Mainz, and commencing at Bingen, the Rhine runs between two mountain-regions in a narrow valley. This valley, which extends about 80 miles, from Bingen to Bonn, is the most beautiful part of the Rhine, and yearly attracts numerous visitors. Numerous tributaries join the Rhine in its middle course. Those which flow into it from the west are chiefly the Moselle and its confluents. [MOSELLE.] Those from the east are the Neckar, Main, Lahn, and Sieg. [BAVARIA; NECKAR-KREIS.]

Lower Rhine.—From Cologne to its mouths, a distance of about 300 miles, the course of the Rhine is through a low level country. The current is extremely gentle. From Cologne downwards, the Rhine may be navigated by vessels of 300 tons burden; but flat river-barges are generally used, on account of the numerous sand-banks which narrow the navigable channel. Near the village of Pannerden, which is within the territories of Holland, the Rhine divides into two arms, of which the southern is called the Waal, and the northern preserves the name of Rhine. Nearly two-thirds of the volume of water run into the Waal, which is more than 210 yards wide, while the Rhine is only 114 yards wide. The Waal runs westward, and the Rhine north-north-west. The Rhine divides again about 12 miles lower down, above Arnheim, into the Yssel, which runs to the north, and the Rhine, which turns off to the west. The Rhine running westward divides for the third time about 30 miles lower down, at Wyck. The southern arm is called the Leck, and the northern goes by the name of Kromme Rhyn (Crooked Rhine): the Leck is the larger river. The Crooked Rhine runs north-west to Utrecht, where it divides for the fourth and last time. The arm which runs northwards is called the Vecht, and falls into the Zuider Zee; the other, whose name is changed into that of Oude Ryn (Old Rhine), continues westward through the marshes of Holland, where the waters are used for feeding numerous small canals. It passes through Leyden, and formerly did not reach the sea, being prevented by some sandy dunes which line the shores of this part of Holland; but in 1807 a canal was made from them to the sea at Katwyck. The Waal joins the MEUSE, or Maas, near Gorcum. The Leck, or middle branch of the Rhine, runs from Wyck westwards for about 50 miles, and enters an arm of the Meuse, that runs along the north shore of the island of Ysselmonde. Besides the rivers above named, the Lower Rhine receives the Erft, Ruhr, and Lippe. The whole country between the arms of the Rhine is intersected by numerous canals, most of which serve for the purpose of internal navigation.

The whole course of the Rhine amounts to about 870 miles, of which about 570, from Basel to its mouths, are navigable.

The delta of the Rhine is bounded on the east by the Yssel, on the south by the Waal and Maas, and on the other sides by the North Sea and the Zuider Zee: it comprehends the whole of the three Dutch provinces of North and South Holland and Utrecht, and nearly two-thirds of Guelderland. The whole of the Lower Rhine is subject to destructive inundations. The Delta would occasionally be flooded if it were not protected by embankments.

The basin of the Rhine, according to a tolerably accurate calculation, covers a surface of 79,482 square miles. Though it extends from 46° 30′ to 52° N. lat., nearly the whole of it has the same climate, on account of the southern portion having the greater elevation.

From Basel to Mainz the Rhine is navigable for barges of 100 tons; from Mainz to Cologne, for vessels of 200 tons; and lower down, for vessels of 300 tons. The river is connected by canals with the Saône and Rhône, the Schelde, the Meuse, and the Danube. A very important trade in colonial produce, manufactured goods, timber, coal, iron, corn, wine, and other agricultural products, is carried on by the Rhine, and its chief navigable feeders, the Moselle, the Main, and the Neckar. This trade has been greatly increased by the policy of Prussia, which has rendered most of the large towns on her part of the river free ports; and the resolution of the government of the Netherlands, about the present time, February, 1850, to abolish the Rhine duties altogether, is likely to add a great stimulus to this traffic. The river is now navigated by the steam-vessels of three companies—those of the Cologne Company, plying between Arnheim in Holland and Strasbourg; the Düsseldorf Company, between Rotterdam and Mannheim; and the Dutch Company's boats from Rotterdam to Mainz. From Basel a railroad runs along the right bank of the river to Wiesbaden, and another runs along the left to Strasbourg, whence a line, now nearly completed, passes to Paris. A short line joins Bonn with Cologne, and from Deutz, a suburb of the latter, a line runs through Düsseldorf into the great railway system of North Germany.

RHINE, ANCIENT (*Rhenus*, Ῥῆνος). The Romans first became acquainted with the Rhine

by the conquests of Julius Cæsar in Gaul, who crossed it twice to punish the Germans. (Cæs., 'Bell. Gall.,' iv. 16, 17; vi. 9.) He knew however nothing of the northern or southern part of the river except from report, and appears himself never to have gone farther north than the Scaldis (Schelde).

The campaigns of Drusus and Tiberius in Rhætia and the north-western parts of Germany gave the Romans a more accurate knowledge of this river.

Ancient writers differ respecting the number of mouths by which the Rhine falls into the ocean. Cæsar says that there are several, but most other writers speak only of two or three. According to Tacitus, who says that it has two mouths, the western is called Vahalis till its union with the Mosa, when it takes the name of the latter river, while the eastern, which forms the boundary between Gaul and Germany, preserves the name of Rhine. Pliny and Ptolemæus say that the Rhine falls into the sea by three mouths, of which the eastern, according to Pliny, was called Flevum, and the western, formed by the union with the Mosa, Helium; while the middle one, which was only a stream of moderate size, retained the name of Rhine. The channel called Flevum is supposed to have been formed by the canal which Drusus dug to connect the Rhine with the Isala, and by means of which he and Germanicus sailed to the ocean. The Isala, increased by the waters of the Rhine, flowed northwards into a great lake called Flevo, on issuing from which it became a river again, and fell into the ocean after forming an island of the same name. (Mela, iii. 2.) In course of time the sea made great inroads upon the land round the mouth of this river, till at length it submerged that part of the country, and became united with the lake Flevo, thus forming the modern Zuider Zee.

RHINE, CIRCLE OF THE. [Rhein-Kreis.]

RHINO'CEROS (in Greek ῥινόκερως) the name of a genus of the Pachydermatous order of Mammalia.

It is not easy to determine the extent of knowledge possessed by the Greeks relative to the species comprehended in the present genus. The account of Ctesias respecting the Wild Ass, or Indian Ass ('Indic.'), by some supposed to refer to the Indian Rhinoceros, is very indefinite. Aristotle, who (lib. viii., c. 28) speaks of Ctesias as not being worthy of credit, notices (lib. ii., c. 1) the Ἰνδικὸς ὄνος (Indian Ass). He observes that he has never seen a one-horned solidungulous animal; but there are a few which are monoceratous and solidungulous, such as the one-horned Indian Ass, and that it is the only one of the solidungulous animals which has an astragalus.

Agatharchides describes the one-horned Rhinoceros by name, and speaks of its ripping up the belly of the Elephant. (Phot. 'Bibl.,' ccl.) This is probably the earliest occurrence of the name Rhinoceros.

That the Romans were acquainted both with the one-horned Indian species, and with a two-horned species from Africa, appears to be very certain. Martial speaks of one, exhibited in the circus, as tossing the bear on its double horn (*gemino cornu*). (Martial, 'De Spectaculis Libellus,' Epig. xxii.) Moreover Mr. Wood ('Zoography') gives an engraving of a coin of Domitian (small Roman brass) on the reverse of which is the distinct form of a two-horned Rhinoceros.

The first rhinoceros seen by modern Europeans appears to have been a *Rhinoceros unicornis*, Linn., sent from India to Emmanuel, King of Portugal, in 1513. Emmanuel sent it as a present to the pope, but the animal in an excess of fury sunk the vessel on its passage. A sketch of the animal was sent from Lisbon to Nürnberg for Albert Dürer, who engraved the extravagant figure from which those of Gesner, Aldrovandi, Jonston, and Scheuchzer were taken. Among other monstrosities, the animal, which is represented as if it were clad in offensive and defensive armour, has a second small horn projecting from the top of the shoulders. A reduced copy of the same figure is given in the early edition of Petiver.

In 1685 one was brought alive to England; another was shown throughout a great part of Europe in 1739; and a fourth, a female, in 1741. The Rhinoceros of 1739 was described and figured by Parsons ('Phil. Trans.,' xlii.), and he also mentions that of 1741, which animal Cuvier believes to be the same that was shown at Paris in 1749, painted by Oudri, and afterwards engraved by Edwards ('Gleanings'), and that figured by Albinus. It was certainly that described by Daubenton, and the subject of the observations of Meckel. The Rhinoceros whose osteology is described by Cuvier was the fifth that had come to Europe. It arrived at Versailles in 1771, being then very young, and Buffon notices it in his supplement. This animal died in 1793, at the age of 25 or 26. In 1790 a rhinoceros was brought from the East Indies to this country as a present to Mr. Dundas, who gave the animal away. It was afterwards purchased by Pidcock for 700*l.*, and was exhibited at Exeter Change and about the country. A seventh, very young, destined, it is said, for the menagerie of the Emperor of Germany, arrived from the Indies in 1800, and died in London soon after its arrival: this animal was dissected by Mr. Thomas, who published his observations in the 'Philosophical Transactions.' An eighth, which afterwards went to Germany, was seen at Paris not many years ago. All these were one-horned. Of late years several of the same species (*R. Indicus*) have arrived in London: one of these, a very fine healthy animal, was bought by the Zoological Society of London, and is now (February, 1850) alive in their gardens in the Regent's Park.

No two-horned Rhinoceros seems to have been brought alive to Europe in modern times. Indeed, up to a comparatively late period, this form was known only by the horns which were preserved in museums, nor did voyagers give any sufficient details to impart any clear idea of the form of the animal.

The genus Rhinoceros contains six living species, as far as naturalists are able to determine,

and also several fossil species, the relics of which occur in the same strata as those of the fossil Elephant.

The animals of the present genus are all remarkable for the massiveness of their form and the clumsiness of their proportions; they are however more prompt and rapid than might be at first supposed, and when attacked they rush on their foes with headlong impetuosity. The body is of great bulk, and protuberant at the sides; the neck is short and deep; the shoulders are heavy, the limbs thick; the feet are divided into three toes, encased in hoofs; the skin is thick and coarse, with a knotty or tubercular surface, destitute, or nearly so, of hairs. In the common Indian species it is disposed in large folds, especially on the neck, shoulders, haunches, and thighs. The eyes are small, and placed nearer the nose than in other quadrupeds, and high towards the upper surface of the skull. The head is large and ponderous; it is elevated between the ears, whence it sweeps with a concave line to the nasal bones, which rise in the form of an arch, to support the horn. The upper lip is soft, flexible, sensitive, capable of being protruded, and used to a certain degree as an organ of prehension. But that which gives most character to the head of the Rhinoceros is the horn; single in some species, double in others. This organ is of an elongated recurvent conical figure, arising from a broad limpet-shaped base, seated on the nasal bones, which are of a thickness and solidity not to be found in other races of quadrupeds. In the two-horned species, the posterior horn rests on the os frontis. The horn of the Rhinoceros is a solid mass, structurally composed of agglutinated fibres, which are analogous to hair, and have much resemblance to those into which whalebone is so easily separable.

The existing species are confined to the hotter regions of the old world, viz. India, Java, and Sumatra, and Africa. Of these, the *Rh. Indicus* is peculiar to Continental India, beyond the Ganges, and in Siam and Cochin-China. One (*Rh. Javanus*) is a native of Java, and one with two horns (*Rh. Sumatranus*) of Sumatra. Three two-horned species are known as natives of Africa, viz. *Rh. bicornis*, Linn.; *Rh. Africanus*, Cuv.; *Rh. simus*, Burchell; and *Rh. Keitloa*, Smith. There are probably other African species. A pair of horns, brought by Salt from Abyssinia, and now in the Museum of the Royal College of Surgeons, cannot be with certainty referred to any known species, and Dr. Smith considers a pair brought by Major Denham from North Africa to be different again, and unlike those of any species. Clubs of rhinoceros horn, about three feet in length, have been brought from Dahomy, Western Africa.

For details connected with the anatomy of the different species of the present genus, we must refer to Cuvier ('Oss. Foss.' and 'Anat. Comp.'); to the 'Catalogue of the Contents of the Museum of the Royal College of Surgeons in London,' Part iii.; to the 'Phil. Trans.,' vol. lxxxiii. (1815); to Sparrman's work on South Africa, and the 'Cyclop. of Comp. Anat.,' &c.

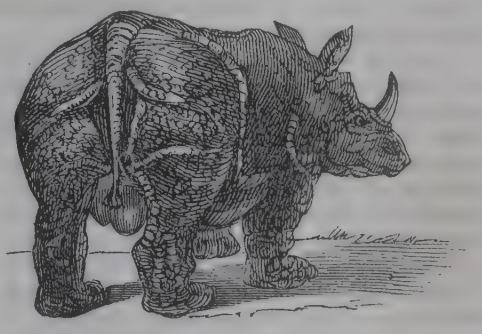
Asiatic Rhinoceroses.

Rhinoceros Indicus (*Rhinoceros unicornis*, Linn).

Specific Character.—Dental formula:

$$\text{Incisors, } \frac{4}{4}\text{; canines, } 0\text{; molars } \frac{7-7}{7-7} = 36.$$

A single horn on the nose. Skin naked, very thick, of a dull deep purplish gray, marked with sub-elevated, rounded, and other inequalities, and remarkable for the deep folds which it forms behind and across the shoulders, and before and across the thighs, &c. There are a few stout, stiff, horny, and smooth hairs on the tail and on the ears.



Rhinoceros Indicus

Locality, Food, &c.—This species inhabits the East Indies, especially beyond the Ganges. It is recorded as having been found in Bengal, Siam, and Cochin-China. Shady forests, the neighbourhood of rivers, and marshy places are favourite localities. Their ordinary food consists of herbage and the branches of trees. The flesh is said to be not unpalatable.

Rhinoceros Javanus, Cuv.

Specific Character.—One-horned; folds of the neck obsolete; scutules of the skin angled at the margin, concave in the middle, and furnished with a few short bristles; margin of the ears and under side of the tail hairy.

Locality, Habits, Manners, &c.—Gregarious in many parts. Dr. Horsfield states that it is not limited to a particular region or climate, but that its range extends from the level of the ocean to the summit of the mountains of considerable elevation. Dr. Horsfield noticed it at Tangung, near the confines of the Southern Ocean, in the districts of the native princes, and on the summit of the high peaks of the Priangan regencies, but it prefers high situations. 'It is not,' adds Dr. Horsfield, 'generally distributed, but is tolerably numerous in circumscribed spots distant from the dwellings of man and covered with a profuse vegetation. On the whole it is more abundant in the western than in the eastern districts of the island. Its retreats are discovered by deeply-excavated passages which it forms along the declivities of mountains and hills. I found these occasionally of great depth and extent. In its manners the Rhinoceros of Java is comparatively mild. It is not unfrequently met in the wilds by Europeans and by natives. No instance of its showing a disposition to make an attack has come

to my knowledge. Being the largest animal in Java, its passions are not roused, as in many parts of India, by contentions with the elephant. It is rarely seen in a domestic state, but is occasionally decoyed into pits, and destroyed. Our animal rambles chiefly at night, and often occasions serious injury to the plantations of coffee and pepper, which are laid out in the fertile districts selected for its retreats. The horns and skin are employed for medicinal purposes by the natives.'

Rhinoceros Sumatrensis, Cuv. (*Rhinoceros Sumatranus*, Raffles).

Specific Character.—Four great incisors, as in the two preceding species, but hardly any folds on the skin, which is hairy; a second horn behind the ordinary one.

The first satisfactory indication of the existence of this species occurs in Pennant, who imagined that the two-horned species of Sumatra was identical with *Rhinoceros bicornis*, the only African species then known. He quotes the following remark of Mr. Charles Miller, who was long resident in Sumatra:—'I never saw but two of the two-horned Rhinoceros; but I believe they are not uncommon in the island, but are very shy, which is the reason they are but seldom seen. I was once within twenty yards of one. It had not any appearance of folds or plaits on the skin; and had a similar horn resembling the greater, and, like that, a little turned inward. The figure given by Dr. Sparrman is a faithful resemblance of that I saw.'

The first figure was published by Mr. William Bell in 1793.

African Rhinoceroses.

Rhinoceros Africanus, Cuv. (*Rhinoceros bicornis*, Linn.)

Specific Character.—Pale yellow brown; horns unequal in length; neck surrounded with a furrow at the setting on of the head; eyes brown. Length 10 feet 11 inches. (Smith.)

Dr. Smith remarks that the present species, under the name of *Rhinoster*, has been familiarly known to the colonists of the Cape of Good Hope ever since 1652. In that year, when the Dutch first formed their settlement on the shores of Table Bay, this animal, he observes, was a regular inhabitant of the thickets which closed the lower slopes of Table Mountain. 'The abandonment of those spots by this animal as a measure of safety,' says Dr. Smith in continuation, 'probably constituted the commencement of a forced migration, which has continued to extend ever since, and which has led not only to the disappearance of the species from the districts within the present colonial limits, but also in a great measure to its removal from countries beyond those limits, as far as hunters sufficiently armed are accustomed to resort. If a system such as has hitherto prevailed continues to exist, and the larger animals persevere in flying to avoid the effects of fire-arms, the time may arrive when the various species which formerly may have been scattered, each in a peculiar locality of a large continent, will be huddled together; and indeed an advance towards that period is in progress, as may be inferred from the concentration which is at present taking place in the interior of South Africa.

'Though many of the individuals which inhabited the countries where now not a single Rhinoceros is to be seen, were doubtless destroyed, yet it is equally certain that many others escaped, and thereby assisted in adding to the accumulation which is in progress in other localities. Until lately the present was the only species of the genus which was known to be receding from its native country, but of late another has been led to a like course; and the *Rhinoceros simus*, which but a few years ago was common in the neighbourhood of Latakoo, has, since the more general introduction of fire-arms into that country, almost entirely ceased to approach within a hundred miles of it. From a consideration of the various facts which we have collected in relation to the species now under consideration, we feel disposed to regard it to a certain extent as a prisoner in the country it now inhabits, and are inclined to believe the southern extremity of the continent and the country along the western coast towards Benguela to have once formed its favourite residence.'

Rhinoceros Keitloa (Smith).

Specific Character.—Pale brownish yellow; the two horns subequal in length, the anterior one cylindrical, the posterior one compressed; anterior part of the upper lip produced and accuminate. Length, body and head, 11 feet 1½ inch. Height, 5 feet.

Rhinoceros Keitloa. (Male.)

Locality, Habits, &c.—Dr. Smith thinks that it may with propriety be inferred that the *Keitloa* has not, for many years at least, been in the habit of generally extending its range higher than about 25° S. lat. He remarks that we have sufficient evidence that individuals of this species have approached Latakoo, or rather the country some sixty miles to the north of it, in the fact that Mr. Burchell, 'whose merits as a traveller can be best appreciated by those who follow him in the same field, is at present in possession of the horns of an individual which was killed by his hunters.' Dr. Smith further states that the natives at and around Latakoo are only acquainted with two species, viz. *Borili* (*Rhinoceros bicornis* of authors) and *Mohoohoo* (*Rhinoceros simus*, Burch.); and those who were in the employ of

the expedition declared, when they first saw the *Keitloa*, that it was not an animal of their country; and at once enlarged upon the points in which it differed from *Borili*. During the discussion an intelligent Moharotsi, who was well acquainted with the animal, approached, called it by its name, and referred Dr. Smith to districts where specimens were found in abundance. It was found to be as he stated, though everywhere the species appeared rare when compared with the others; and after several months' wanderings it was remarked that only sixty-eight individuals had been seen, eight of which, in one herd (two of them not more than half-grown), were disturbed, when feeding near to the banks of a river which the party were descending, by Dr. Smith himself. According to the evidence of the natives given to Dr. Smith, the *Keitloa* is of a very savage disposition, on which account it is more feared than *Borili*, which is also deemed ferocious.

The food of this species consists of small shrubs, or the more delicate branches of brushwood, in collecting which, Dr. Smith observes, the prolongation of the anterior extremity of the upper lip proves a useful assistant.

Rhinoceros simus, Burchell.

Specific Character.—Pale gray brown, tinged with yellow brown; margins of the ears towards the tips, and tail both above and below at the extremity, clothed with stiff black hairs; mouth, ox-like; two horns, the anterior one much the longest; eyes yellowish brown. Length, body and head, 12 feet 1 inch. Height, at the shoulder, 5 feet 7 inches.

'Mohoohoo, the name of this species among the Bechuanas,' says Dr. Smith, 'is considered by them to be one of the original animals of their country, and to have issued from the same cave out of which their own forefathers proceeded: in this respect they make a difference between it and *Keitloa*, with whose origin they do not profess to be acquainted.'

Locality, Food, Habits.—Mr. Burchell, who has added so much to our knowledge of the zoology of Africa, found, when he was in Latakoo, this species common there; and the natives told Dr. Smith that it was not unfrequently found even farther to the southward. The last-named author however tells us that it has almost ceased to exist, even in the situations where its discoverer met it; and the Doctor observes that this is accounted for by the danger to which it is exposed being now much increased from the general introduction of fire-arms among the Bechuanas. He also remarks that the form of the mouth at once suggests the kind of food upon which the animal probably subsists; and an examination of the contents of the stomach, principally grass, confirmed the inference. Localities abounding in grass are therefore the haunts of the *Mohoohoo*, and to enjoy them throughout the year, he is necessitated to lead a more wandering life than the two previous species.

Fossil Rhinoceroses.

About nine extinct species of Rhinoceros are described. Almost every bone cavern in England, France, and Germany, has afforded them in abundance, and Dr. Buckland proves that there must have been a long succession of years, in which the Elephant, Hippopotamus, and Rhinoceros, with the Hyæna, inhabited our island, and that the former animals, as the bones testify, became the prey of the latter, or were devoured after natural or accidental death.

The following fossil species have been recorded:—*Rhinoceros tichorinus*, Cuv.; *Rhinoceros incisivus*, Cuv.; *Rhinoceros leptorhinus*, Cuv.; *Rhinoceros minutus*, Cuv.; *Rhinoceros elatus*, Croiz. and Job.; *Rhinoceros pachyrhinus*, Cuv.; *Rhinoceros hypselorhinus*, Kaup.; *Rhinoceros Goldfusii*, Kaup.; *Rhinoceros leptodon*, Kaup.

Remains of this genus occur in the tertiary series of beds (Miocene and Pliocene periods of Lyell; in the strata of the last-named period they are most abundant). They are extensively found in the gravel, the bone caverns, and osseous breccia.

'If these animals,' says Dr. Buckland, 'inhabited this country, it follows, as a corollary, that they also inhabited all those other regions of the northern hemisphere in which similar bones have been found under precisely the same circumstances, not mineralized, but simply in the state of grave bones imbedded in loam, or clay, or gravel, over great part of northern Europe, as well as North America and Siberia.' The entire Rhinoceros found in the frozen soil at Wiluji, or Vilhoui, in Siberia, recorded by Pallas, was a most striking discovery, and, followed as it was by the detection of an Elephant in a mass of ice on the shores of the North Sea, aroused the minds of men to a consideration of the causes which might have produced such effects.

RHIO is a Dutch colony, established in 1817, on the island of Bintang, which lies opposite Cape Romania, one of the promontories with which the Malay peninsula terminates on the south. The island of Bintang is a little larger than that of Singapore, and contains about 300 square miles. After Java, Malacca, and the other Dutch colonies had been restored to the Dutch, the Dutch government intended to make themselves masters of the commerce of the Indian Archipelago, and with that view took possession of the town of Rhio, where they built a fortress; but the foundation of the town of Singapore and the rapid growth of that British colony has frustrated their design; yet Rhio is a thriving place. It is visited by many Malay vessels from the adjacent islands, and also by the Siamese. The town and fortress of Rhio are built at the entrance of a wide inlet, called the bay of Tanjong Pinang. The harbour is good and safe, but at its entrance there are many small rocky islands, which render the navigation difficult and dangerous. Rhio is in 1° 25′ N. lat., and 104° 28′ E. long.

RHIZOMORPHA, a singular genus of fungi, having altogether the appearance of the root of a tree. The species are found in damp cellars, old walls, mines, and other subterranean places, where they sometimes acquire a phosphorescent state, which renders them exceedingly curious objects.

RHIZO'PHORA, a genus of plants which gives

its name to the natural family of *Rhizophoreæ*, or the Mangrove tribe, the plants of which are remarkable for their seeds germinating even while attached to the branches, and also for the numerous adventitious root-like projections which serve as supports for the stem. The common Mangrove and also others of the genus are found all along the shores of the tropics, both in the new and old world, rooting in the mud, and forming dense forests even at the verge of the ocean, and below high-water mark; hence, on the retiring of the tide, the stems may often be seen covered with oysters and other shell-fish.

R. Mangle, the common or Black Mangrove, is found abundantly on the shores of the ocean, and within the delta of the Ganges, where it grows to a considerable size.

R. Candel, or Red Mangrove. The wood of this species is heavy, of a deep red, and takes a fine polish. The bark is used in dyeing red, is astringent, and used in the West Indies for the cure of fevers.

R. gymnorhiza grows to a considerable size where the spring-tides rise over it, as in the delta of the Ganges. The wood is yellow, hard, and durable; has a sulphurous smell, and burns with a vivid light; is chiefly used by the natives for fire-wood and for making posts for constructing their houses. The pith of the wood, boiled in palm wine or with fish, is used for food.

RHODE ISLAND, one of the United States of North America, is bounded N. and E. by Massachusetts, W. by Connecticut, and S. by the Atlantic Ocean. It extends from 41° 22′ to 42° 3′ N. lat., and from 71° 6′ to 71° 38′ W. long. The largest part of the state lies to the west and north-west of Narraganset Bay, and comprehends about 900 square miles; a small portion lies to the east of Narraganset Bay; and the rest is composed of the islands of Rhode Island, Connecticut Island, Prudence Island, Patience Island, Hope Island, Hog Island, Dyer's Island, and Block Island, all of which are in Narraganset Bay, except the last, which is in the Atlantic. The total area of the state is 1360 square miles. It is the smallest state in the Union. The population in 1840 was 108,830, of whom 5 were slaves.

The island of Rhode Island, which gives name to the state, is the largest of the islands which belong to it. Its length is about 15 miles N. to S., with an average breadth of about 3½ miles. This island is the most fertile part of the state; the soil is suitable either for tillage or grazing, and is well cultivated; and the climate is very temperate and wholesome.

Narraganset Bay, which intersects a large portion of the state, is about 28 miles long from Point Judith, on the south, to Bullock's Point, 5 miles below Providence, on the north. The average breadth of the bay is about 10 miles. It forms a safe road during the north-west storms, is navigable in all seasons, and contains several excellent harbours.

The surface of the continental part of the State of Rhode Island is generally very level, but is hilly and rocky in some parts, chiefly to the north-west.

The principal rivers are the Seekonk, the Pawtucket, the Pawtuxet, and the Pawcatuck, all of which have a short course. The soil is generally thin, and for the most part better fitted for pasturage than for the plough. Wheat, oats, barley, and rye, and also many kinds of fruit are cultivated to a considerable extent, and the rivers and bay supply plenty of fish. There are mines which afford a considerable quantity of iron-ore, and small quantities of copper-ore are obtained. Limestone is abundant, and there is a mine of anthracite coal in the northern part of the island of Rhode Island.

The exports, which in 1842 amounted to 348,392 dollars, consist principally of cattle, horses, poultry, fish, beef, cheese, butter, lumber, and flax-seed, cotton and linen manufactures, and iron manufactures. The imports, which in 1842 amounted to 323,692 dollars, consist for the most part of the produce of the West Indies and the manufactures of Europe. The manufactures are in a very flourishing condition.

The Providence and Stonington Railroad, 47 miles long, is chiefly in this state, and the Providence and Boston Railroad is partly in it. The total length of canals in Rhode Island is 38 miles.

The State of Rhode Island is divided into 5 counties. The following are the principal towns, with the population of each in 1840:—*Bristol*, 18 miles S. by E. from Providence, is situated on the eastern side of Narraganset Bay, and has a good harbour. Population, 3490. *Coventry*, 13 miles S.W. from Providence, on a branch of the Pawcatuck, has several cotton factories and two woollen factories. Population, 3433. *Newport*, one of the seats of government (Providence being the other), 30 miles S. by E. from Providence, is situated on the south-west side of Rhode Island, 5 miles from the sea. The harbour is safe, easy of access, capacious, and sufficiently deep for vessels of the largest class. The town rises gradually from the harbour. It contains a state-house, market-house, theatre, and 12 churches. The commerce of Newport is considerable. Population, 8333. *Providence*, a city, and the other seat of government, is situated at the head of Narraganset Bay, 35 miles from the sea, in 41° 51′ N. lat., 71° 16′ W. long. The town stands at the top of an inlet which is called Providence River, but which is only an arm of the bay reaching to the mouth of the river Seekonk. It is built on both sides of the Providence River, and the two parts are connected by two bridges. Vessels of 900 tons burthen can come up to the wharfs. Most of the houses are of wood, and painted white, but there are several of granite and brick. The principal buildings are — the state-house, of brick; the arcade, of Doric architecture, the body of stone, and the two porticos of granite; the two halls of Brown University; the Athenæum; and the Dexter Asylum. There are 21 churches. Providence is a place of great manufacturing industry. There are large cotton manufactories, worked both by steam and by water-power; extensive bleaching establishments; dye-houses; iron foundries; manufactories for making steam-engines and steam-boilers; brass-

foundries; and establishments for working in gold, silver, tin, sheet-iron, copper, brass, &c. The commerce is extensive. It is connected by railways with Boston, N.N.E.; with Stonington, S.S.W.; and with Worcester, N.N.W. It has also daily communication by steam-boats with New York and other places. The aggregate burthen of the vessels belonging to the port in 1840 was 16,610 tons. Population, 23,171.

The State of Rhode Island was first established at Providence, in 1636, by Roger Williams, who fled from Massachusetts in consequence of the persecution to which he and his congregation were subjected on account of their religious opinions. He purchased the ground from the Indians. A settlement was made on Rhode Island in 1638, and a charter was granted by Charles II. in 1663, which formed the basis of the constitution till 1842, when a new constitution was formed, and is now in operation. The legislature consists of 31 senators, who are elected for one year, and 69 representatives, who are elected for one year. The governor is elected for one year. The state sends 2 senators and 2 representatives to Congress.

RHODES, an island off the coast of Caria in Asia Minor, opposite to Cape Volpe, between the gulfs of Syme and Macri. The harbour of the city of Rhodes is in 28° 12′ E. long. and 36° 26′ N. lat., according to Niebuhr.

Rhodes was inhabited in very early times, and acquired considerable commercial eminence several centuries before the Christian era. About 660 B.C. the ancient kingly form of government which prevailed in the island, as in other Dorian states, was abolished, and magistrates, called Prytanes, probably substituted. In 408 B.C. the city of Rhodes was founded, by collecting into one spot the inhabitants of Lindus, Ialysus, and Camirus; and from this time the history of the city is identical with the history of the island. In 357 Rhodes reverted for a short time to the dominion of Athens, against which state it soon after formed a league with Cos, Chios, and Byzantium. It submitted like the rest of Greece to Alexander; but having struggled courageously through the conflicts consequent on Alexander's death, Rhodes became the mistress of the Mediterranean.

The celebrated Colossus of Rhodes was made about 300 B.C. It was begun by Chares, a pupil of Lysippus, and completed by Laches. It was formed of brass; the height is said to have been 70 cubits; the thumb was so large that few men could span it; twelve years were employed in making it. The notion that its legs rested one on each side of the harbour of Rhodes does not seem to be supported by any good authority, and modern travellers do not agree as to its site. After it had stood for 56 years, it was thrown down by an earthquake.

Rhodes first came into connection with the Romans about 200 B.C. as an allied power; but the fluctuations of war afterwards brought the two powers into collision, and Rhodes gradually declined in importance. From 168 B.C. to the time of Vespasian, Rhodes was seldom in a condition to exhibit any power independent of Rome. Vespasian incorporated this island in a Provincia Insularum, of which it was probably the seat of government.

In the reign of Heraclius (A.D. 616), Rhodes is mentioned among the conquests of Chosroo, king of Persia, but reverted to the dominion of the Greek emperors shortly afterwards. In the caliphate of Othman, A.D. 651, it was taken by one of his generals. It afterwards passed again into the hands of the Greek emperors. In the year 1310 Fulke de Villaret, grand-master of the Knights of St. John, carried into execution the design of his brother and predecessor Guillaume de Villaret, and made himself master of the island, which became from that time the place of residence of the Order, till their final expulsion in the 16th century. Five years after their settlement they sustained a formidable siege from Othman, the Turkish sultan, and notwithstanding the unprepared state of their fortifications, succeeded in repulsing him, and a few years afterwards his son Orkan. From this period they continued to resist the constantly-increasing power of the Turks for about 200 years. In 1344 they attacked and took Smyrna, which they maintained as an outpost. In 1480 Mahomet II. laid siege to Rhodes, and notwithstanding the immense force of artillery employed against it, could not take the place. The last and most memorable siege of Rhodes was in June, 1522. [MALTA.] Rhodes has ever since remained a province of the Turkish Empire.

The greatest length of Rhodes from north to south is about 36 miles, and breadth 18 miles. The air is mild and healthy, and the soil fertile, producing grapes, figs, and corn. The population is variously estimated at from 20,000 to 40,000. The inhabitants are governed by a bey, who holds his office for life, a circumstance which is favourable to the inhabitants, who are less oppressed than in other Turkish governments, where there is a more frequent change of masters. The bey farms the revenues and pays an annual sum of half a million of piastres every year to the Porte, besides fitting out a frigate every two or three years. Ship-building is the chief employment of the Rhodians.

Of the town of Rhodes there are no remains earlier than the time of the knights, but all their works are interesting specimens of the military architecture of the middle ages. On entering Rhodes from the sea, two harbours, separated by a narrow quay, present themselves, the larger being on the north. The quay which separates them forms a curve, having on its extremity next the sea a round tower, and farther inland a square one of great strength, and crowned with turrets of observation at the four corners. Attached to it is a curtain, which connects it with the fortifications of the town within. From the other side of the smaller harbour a narrow quay juts out, on which is another round tower. The Turks have suffered the entrance to the larger harbour to be so much obstructed as to impede the navigation. The buildings of the town exhibit a curious mixture of European and Saracenic styles. The island contains few remains of the ancient towns.

RHODEZ. [AVEYRON.]

RHO'DIUM, a metal discovered by the late Dr. Wollaston, and named from *rhodon* (ῥόδον, a rose), on account of the colour of one of its solutions. This metal exists in combination with platinum. Rhodium is white, has a metallic lustre, is brittle, extremely hard, and its specific gravity is about 11. It suffers no change by exposure to air, either dry or moist.

Oxygen and Rhodium combine to form a greenish gray peroxide ($R^2 O^3$). When this peroxide is heated, it becomes black, and is then probably converted into protoxide ($R^1 O^1$). *Chlorine and Rhodium* probably unite in two proportions, but the perchloride only has been hitherto obtained in a separate state. It has a dark brown colour; and the aqueous solution of this salt is a fine rose-red colour, whence the name of the metal which it contains: it consists of $R^2 Ch^3$. *Sulphur and Rhodium* may be made to combine by heating them together, the metal being in a state of minute division; it fuses at a white heat without decomposition, and has a bluish-gray colour.

Alloys of Rhodium.—Rhodium forms very hard alloys with other metals, which are used for the nibs of pens.

Salts of Rhodium.—The salts of the peroxide only have been formed. Their general properties are little known.

RHODODENDRON, a genus of evergreen shrubs, very common in gardens, is one which differs from Azalea [AZALEA] principally in the stamens being 10 instead of 5, in the corolla being campanulate, not tubular, and in the foliage being hard and evergreen. The species are nearly related to each other, and occur both in the new and old worlds. Of the numerous varieties to be seen everywhere in flower in this country, in the months of May and June, the greater part belong to *R. ponticum*, a species found wild on the coasts of the Black Sea from the range of Caucasus through Armenia and Georgia to the western frontier of Persia, or to *R. catawbiense*, an American species, or to hybrids between these. *R. ponticum* was at one time supposed to be the plant which rendered the honey of Asia Minor poisonous; but it has been ascertained that the effect is really produced by *Azalea pontica*. In the warmer parts of India there occurs the Tree Rhododendron, with crimson or white or pink flowers, one of the most beautiful of all trees, too tender to bear the open air in England, but a noble object in a conservatory. There are also some mountain species in the Himalayas, one of which, *R. campanulatum*, is strikingly handsome, and quite hardy. By means of crossing the crimson Tree Rhododendron with some of the hardy species, a race of hybrids has arisen, which are much cultivated as hardy greenhouse plants, and in Ireland and some of the milder parts of England they will endure the open air without protection. They are perhaps more beautiful than any of their parents. The most curious of these hybrids is a yellow one obtained a few years ago by Mr. Smith, a nurseryman near London, by crossing a Rhododrendron with the yellow Chinese Azalea; this is perhaps one of the finest artificial productions yet obtained by florists. The Alpine Rhododendrons, *hirsutum* and *ferrugineum*, with small campanulate crimson flowers, are handsome dwarf shrubs in elevated situations, but they dislike the low grounds near London. The leaves of *R. chrysanthum*, a species with yellow flowers from Siberia, have a great reputation as a remedy for chronic rheumatism; its effects are those of a powerful narcotic.

RHODOMANNUS, LAURENTIUS, was born in 1546, at Sassawerft, on the estates of the Counts of Stolberg. His parents were poor, and as the boy early displayed great talents, Count Stolberg sent him at his own expense to the gymnasium at Ilfeld. He afterwards went to the university of Rostock, where the Greek literature, which was then reviving in Germany, was his principal study. After the completion of his studies, he held several offices as teacher, but was afterwards invited to the professorship of Greek literature in the university of Jena, and subsequently to that of history at Wittemberg, where he died January 8, 1606.

The chief merit of Rhodomannus consists in his efforts to diffuse a taste for Greek poetry, and he made Greek verses himself. Rhodomannus also made some Latin translations of Greek authors, as of Diodorus Siculus, which is printed in the edition of H. Stephens (1604), and of the 'Posthomerica' of Quintus Calaber; he also made a translation of extracts from 'Photii Bibliotheca' and Diodorus Siculus, under the title of 'Memnonis Historia de Republicâ Heracleensium et Rebus Ponticis Eclogæ,' Helmstadt, 1591, and reprinted at Geneva in 1593.

RHOMB, RHOMBUS, RHOMBOID. These terms have been used in various significations by different writers, and the second and third have been sometimes distinguished from each other in meaning. It is not worth while to do more than state, that when either of them is now used, it signifies an equilateral oblique parallelogram. The Latin dictionaries define *rhomboides* to be a parallelogram, and *rhombus* an equilateral parallelogram.

RHONE (*Rhódanus*), a river, which drains considerable portions of Switzerland and France, has its source under an ice-field on the Mont-de-la-Fourche (Furka Pass), near the St. Gothard, and within 4 miles of one of the sources of the Rhine, at an elevation of 5806 feet above the sea. Its upper course lies in the wide valley of the canton of Valais, through which it flows with great rapidity in a south-west direction, forming several cascades, and receiving many other impetuous mountain streams from the numerous valleys that open into its bed on either hand. Having reached Martigny, where it is joined by the Dranse, the river makes an abrupt bend to the north-west, and enters the eastern extremity of the lake of Geneva, which it traverses in its whole length, depositing therein the mud that discoloured its troubled waters, and emerging at the city of Geneva in a clear stream of an indigo hue. This distinction however it retains only to its junction

with the Arve, by which its waters are again defiled. On emerging from the lake of Geneva the river resumes the original south-west direction, until it strikes against the rocky precipitous side of the Jura Mountains, whence forming the boundary between France and Savoy, it glances nearly southwards, through savage gorges, past Fort-de-l'Ecluse, below which it forms the subterranean cascade called *Perte-du-Rhône*. [AIN.] Below the fort of Pierre-Châtel in the south-east of the department of Ain, the Rhône again bends sharply round to north-west, leaving the frontier of Savoy, and separating the French departments of Ain and Isère. From Lagnieu it runs first S.S.W., and then W. to Lyon, where it receives into its rapid current the gently-flowing Saône, on the right bank. From this point the course of the river is nearly due S. past Vienne; Valence, above which the inky waters of the Isère enter it [ISERE]; Avignon, not far from which it is joined by the impetuous Durance; Beaucaire; and Arles, where it divides into two arms, that enclose between them the delta called Ile de Camargue—the more eastern arm (le Grand Rhône), throwing itself into the Mediterranean near the Tour-St.-Louis; the western one (le Petit-Rhône), opposite the Saintes-Maries Isles.

The whole length of the Rhône is 530 miles, 348 of which are in France. The river is navigable *downwards*, from near Seyssel to its mouth, a distance of 330 miles; for some miles higher up it is available for floating timber. Steamers ply between Lyon and the Mediterranean; owing however to the rapidity of the current, the *up* navigation is very slow. In this part of its bed the river forms a great number of islands, capriciously sweeping some away, and depositing others almost daily; a circumstance which greatly impedes the navigation. The Rhône however is a most important highway for the transfer of the produce of this part of France; and it is connected by the Saône, which is navigable for steamers up to Châlon, and by canals with the Bay of Biscay, the Rhine, the Seine, and the Loire. Its basin, including the Swiss cantons of Valais, Vaud, and Geneva, the duchy of Savoy, and 14 French departments, most of which are famous for their corn, wine, silk, and oil, has an area of 30,856 square miles, with a population (1847) of 5,917,201; and is included between the Alps, the Jura, the Vosges, and the Cévennes. The most important feeders of the Rhône on the right bank, besides the Saône, are the Ain, the Ardêche, and the Gard. The river has a total fall of about 1000 feet from the lake of Geneva to the sea. In the lower part of its course its waters are turned to great advantage in fertilising the land near its banks by irrigation. Between Lyon and Arles this river is spanned by several fine bridges; some recently erected are wire suspension bridges.

RHÔNE, a department of France, formed out of the old province of Lyonnais, is bounded N. by Saône-et-Loire, E. by the departments of Ain and Isère, and S. and W. by that of Loire. Its greatest length from N. to S. is 63 miles; from E. to W. 28 miles. The area is 1077.5 square miles, and the population in 1846 was 545,635; which gives 506.389 to the square mile, or 332.639 above the average per square mile for the whole of France. The department has a less area than any other in France, except that of Seine; in density of population it ranks third, being exceeded only by the departments of Seine and Nord.

The department is mountainous. The main ridge of the Cévennes runs nearly N. and S. along the western boundary, and sends out several offshoots, which slope down to the Rhône and Saône, and cover nearly all the rest of the surface. From a swell in the main ridge, a little W. of Beaujeu, a range springs out eastwards, filling up the space between the Grône and the Andière, and then runs northwards past Macon in the department of Saône-et-Loire. From the same swell another offshoot runs S.S.E., covering the space between the Andière and the Azergue, with the exception of some narrow valleys and the fine plain between Villefranche and Anse. This hilly country forms the old division of Lyonnais, called *Beaujolais*, which was separated from Lyonnais proper by the Azergue, and the pass in the Cévennes, near Mont Tarare, over which the road from Paris to Lyon runs. Between this pass, near which the Tardine rises, and the Brevanne (which is joined by the Tardine at Arbresle), the surface is covered by that part of the Cévennes that contains Mont Tarare, which has an elevation exceeding 4000 feet. South of the Brevanne the Lyonnais Hills, bounded on the south by the Gier, run N.E., extending to the right bank of the Saône, a little north of Lyon, and terminate in the Mont'd'Or group, which rises to the height of 1070 feet, and has been famous since Roman times for the fine wines yielded by the vineyards that cover their slopes. Vast numbers of house-fed goats are reared among these mountains; the cheese made from their milk is in great repute. The south of the department is covered by the eastern extremity of an offshoot from Mont-Pila, which was formerly included in the district of Forez. The most practicable passes over these mountains are—that of Mont-Tarare before mentioned; that of the valley of the Gier, traversed by the railroad from Lyon to St.-Etienne; and a third, which is threaded by the road from Beaujeu to Charlieu. The small district that lies between the Rhône and the Saône constituted what was formerly called *Franc-Lyonnais*, the inhabitants of which were, till 1793, exempted from many grinding exactions that pressed heavily on the rest of France.

The chief rivers are—the RHÔNE, and the Saône [SAÔNE, HAUTE], which form the greater part of the eastern boundary. The largest of the other rivers have been named before; of these the Azergue, after receiving the united waters of the Tardine and the Brevanne, enters the Saône near Anse. The Andière enters the Saône a little E. of Belleville; the Grône flows northwards out of the department of Rhône into that of Saône-et-Loire, and falls into the Saône a little

below Varennes. The Gier is a feeder of the Rhône; several small feeders of the Loire rise within the western boundary; the largest of them is the Rhin, which enters the Loire near Roanne. Particles of gold are found in the sands of several of these rivers. The canal of Givors, which unites Rive-de-Gier with the Rhône, is about 8 miles in length, and with the Rhône and Saône gives the department the advantage of about 80 miles of navigation. Roadway accommodation is afforded by 6 national roads; and the department is traversed by the Lyon-St.-Étienne railroad, and by the Paris-Lyon-Avignon line, now in course of construction.

The mountainous nature of the surface affords great variety of temperature; but the climate is generally healthy and favourable to vegetation. The high lands, especially the Mont-Pila range, are covered with forests of oak, pine, beech, laurel, &c., while on lower sites the maple, the cistus, and many other southern plants flourish. In the extreme south of the department are the famous chestnut forests which yield the favourite large chestnuts sold in Paris by the name of *marrons de Lyon*. The valleys, plains, and accessible slopes are carefully cultivated, the products comprising almost everything that grows in France, except the orange and the olive. The cereal grains chiefly grown are wheat, maize, and buck-wheat; of wheat the produce is only about a third of the consumption. Potatoes, pulse of all kinds, madder, millet, saffron, flax, hemp, oleaginous seeds, and a great quantity and variety of fruits are grown. Of natural pasture there is little; of meadow a considerable breadth. The mulberry is cultivated for the production of silk. The lower slopes of the hills are almost everywhere planted with vines; this is especially the case with the slopes along the Saône and the Rhône, from the neighbourhood of Belleville to Condrieu. This region, which includes the Mont-d'Or, so called from its rich wine products, contains some of the finest vineyards in France. The annual produce is about 17,000,000 gallons; the best sorts are those called Côte-Rôtie, Romanèche, Condrieu, and Sainte-Foy. The nature of the soil admits of few horses, horned cattle, or sheep being kept. On the Mont-d'Or alone about 20,000 goats are fed. Asses are numerous and of good breed. Game and fresh-water fish are abundant.

There are important copper-mines and works at St.-Bel near Arbresle, and at Chessy, a small place on the Azergue. Coal-mines are worked. Lead, gold, manganese, rock-crystal, porphyry, granite, marble, talc, asbestos, gypsum, fuller's-earth, potter's-clay, excellent building-stone, and various other minerals are found. The Mont-d'Or contains excellent stone quarries, and is noted for the great number of fossils it contains. There are chalybeate springs at Neuville-sur-Saône, and at Charbonnières near Lyon.

The department is the most famous spot in Europe for all kinds of silk manufactures, including satins, taffeta, lute-strings, velvets, gold and silver brocade, crape, gauze, shawls, ribands, hosiery, &c. This trade centres at Lyon. There are also important manufactures of plain and figured muslin, handkerchiefs, silk hats, calicos, cotton yarn and twist, blankets, gold and silver lace, small wares, straw hats, mineral acids, machinery and mill-work, and liqueurs. There are besides several dye-houses, bleach-works, type-foundries and printing-offices, breweries, paper-mills, glass-works, potteries, and plaster-mills. The various products named or indicated, together with corn, wool, brandy, raw silk, broad cloth, linen, lace, hardware, hides, bar and sheet iron, ironmongery, timber, planks, staves, &c., form items of an extensive commerce, which is still further increased by the important transit trade carried on by means of the navigable waters of the department, and by the railway to St.-Étienne. [RHÔNE, river; LYON.]

The surface contains 689,649 acres, distributed among 84,060 proprietors and into 725,085 parcels. Of the whole area, 353,670 acres are under tillage; 89,947 are meadow and grass-land; 75,498 are covered with vineyards; 85,170 with woods and forests; 30,244 with heaths and moors; 7547 acres are laid out in gardens, orchards, and nurseries; 24,358 are occupied with roads, streets, and buildings; 9098 with waters; and 11,117 are under various culture.

The department is divided into 2 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Lyon . . .	16	126	384,184
Villefranche .	9	128	161,451
Total. . . .	25	254	545,635

Of the arrondissement of Lyon and of the whole department, the capital is LYON. *Arbresle*, a small place of 1600 inhabitants, situated on a hungry spot, at the confluence of the Brevanne and the Tardine, which are subject to destructive inundations, has silk mills, zinc works, and potteries. *St.-Genis-Laval*, 5 miles S.S.W. from Lyon, prettily situated on the slope of a hill, dotted with numerous country-houses of the merchants of Lyon, has a population of 2200. *Givors*, 13 miles S. from Lyon by the railway to St.-Étienne, is situated at the confluence of the Gier with the Rhône, and at the termination of the Canal de Givors, which unites Rive-de-Gier with the Rhône, and forms a great outlet for the coals and manufactures of the department of Loire. The basin of the canal is 284 yards long by 118 yards in width; it is strongly faced with stone, and lined with quays, stores, and boat-building sheds. The town is well enough built, and has 7465 inhabitants, a considerable trade in coal and coke, numerous glass-works and dye-houses. *Mornant*, 12 miles S.W. from Lyon, on a small feeder of the Rhône, has a population of 2250, and manufactures of broad-cloth and hats. *Neuville*, formerly called *Vimy*, 9 miles N. from Lyon, on the left bank of the Saône, which is here crossed by a handsome suspension-bridge, is a pretty little place with 1800 inhabitants, and manufactures of silk, velvet, and sheet-lead. Near this place was fought the great battle in which Sep-

timius Severus defeated Albinus; Roman armour and coins are frequently found in the plain north-east of Neuville. *St.-Symphorien*, a small place of 1700 inhabitants, stands on the railway to St.-Étienne and on the right bank of the Coise. *Vaugneray*, 8 miles W. from Lyon, has 2000 inhabitants. *Croix-Rousse*, *Guillotière*, and *Vaise*, with populations respectively of 18,790, 25,730, and 5503, are suburbs of Lyon. *Oullins*, 4 miles S. from Lyon, is situated on the right bank of the Rhône, and has 3613 inhabitants. In the parish church is a black marble monument to Jacquard, who died in his house at Oullins, Aug. 7, 1834. *Condrieu*, in the extreme south of the department, on the right bank of the Rhône, is an ancient town of 3300 inhabitants, who are actively employed in boat-building and navigating the Rhône. The environs of the town have been famous since Roman times for the growth of excellent white wines. Black silk, salt, and leather are manufactured; there is besides a good trade in wine, corn, oak staves, hoops, &c. *Brignais*, 6 miles S. from Lyon, stands on a fertile plain in which the battle between the French and the Tard-Venus was fought in 1361, wherein Jacques de Bourbon and his son were slain. The population is about 2000.

The arrondissement of Villefranche is named from its chief town *Villefranche*, which stands on the Morgon, not far from the right bank of the Saône, 17 miles N. by W. from Lyon, and has tribunals of first instance and of commerce, a college, and 7272 inhabitants. The town, which is well built, was founded in the 11th century by Humbert IV., lord of Beaujeu. Its original name was Lunna; but in consequence of the numerous privileges conferred upon it by its founder (one of which was that husbands might beat their wives even to blood-shedding, provided death did not ensue), it took the name of Villafranca. The environs abound with pretty country residences. Villefranche is important for its manufacturing industry, the products of which include cotton and flaxen yarn, nankeen, printed calicos, leather, &c.; there is also a considerable trade in flax, hemp, small wares, and cattle. The town was formerly the capital of Beaujolais. *Anse*, a small place of about 2000 inhabitants, on the left bank of the Azergue, and near its confluence with the Saône, is interesting on account of the number of Roman remains found near it, and of the great fertility of the soil to the north of it, which has given rise to the proverb,

> 'De Villefranche à Anse
> La plus belle lieu de France.'

Beaujeu, the oldest town of Beaujolais, of which it was once the capital, is situated 13 miles N. by W. from Villefranche, at the foot of a hill surmounted by the ruins of the old castle of the Sires of Beaujeu, on the river Ardière, and has 3351 inhabitants. The country about the town, formerly one of the most hungry and barren spots in France, is now densely populated, well cultivated, and abounding with vineyards that yield very choice wines. The industrial products of Beaujeu are paper, cotton yarn, wine casks, and leather; there is a good trade in wine, corn, iron, hides, &c. *Belleville*, N. of Villefranche, on the right bank of the Saône, has 2437 inhabitants. *Tarare*, a manufacturing town of 8707 inhabitants, with a consultative chamber of manufactures, and a council of Prud'Hommes, is situated at the foot of Mont Tarare, in a valley traversed by the Tardine, and in the pass between the mountains of Lyonnais and Beaujolais, through which the road from Paris to Lyon runs. Sixty years ago the place was a mere village; it is now a considerable and well-built town, and the centre of extensive cotton manufactures. The chief industrial products are fine muslins, printed calicos, silks, merinos, leather, and earthenware. *Thizy*, a small place of 1700 inhabitants, 19 miles N.W. from Villefranche; and near it *Cours*, a large village with about 3000 inhabitants, are thriving places, with considerable cotton manufactures.

The department of Rhône, with that of Loire, forms the see of the archbishop of Lyon and Vienne; it is included in the jurisdiction of the High Court and University-Academy of Lyon; and belongs to the 6th Military Division, of which Lyon is head-quarters. Under the late monarchy it returned 5 members to the chamber of deputies; it now sends 11 representatives to the Legislative Assembly of the Republic.

(*Dictionnaire de la France*; *Annuaire de la France pour l'An* 1850.)

RHUBARB. [Rheum.]

RHUDDLAN. [Flintshire.]

RHUMB, or RUMB, is probably the Latin *rhombus*: it seems to have signified originally the meridian, or the principal meridian of a map; perhaps it came to signify this from such meridian being usually ornamented by a distinctive rhombus, such as is added to the north direction on a compass-card. However this may be, a rhumb certainly came to mean any vertical circle, meridian or not, and hence any point of the compass; so that, in modern phraseology, a rhumb is one of the thirty-two principal compass directions, and to sail on any rhumb is to sail continually on one course. Hence a Rumb-Line is a line drawn in the sphere, such as would be described by a moving point which always keeps one course.

RHUS (Sumach, in Greek ῥοῦς), the name of a genus of plants. One of the species, *R. cotinus*, appears to have been known to Pliny, who refers to its dyeing properties, and its place of growth, the Apennines, under the name of Cotinus. (Plin., 'Hist. Nat.,' xvi. 18.) This genus has an extensive geographical range from the south of Europe to the Cape of Good Hope. It is also found in Asia and North and South America. It belongs to the natural order *Anacardiaceæ*, and to the tribe *Sumachineæ*. Most of the species are poisonous, but they are much cultivated as ornamental shrubs, especially on account of the beautiful red colour of their leaves in autumn. Many of them are used also for the purposes of dyeing and tanning; as an astringent principle, to which is frequently added an acid, is common to the whole genus.

RHUS TOXICODENDRON (Trailing Poison-Oak, or Swamp-Sumach), a North-American shrub,

possessed of peculiar properties. The leaves, which are trifoliate, thin, shining when fresh, of a dark-green colour, are the only parts officinal in this country. But the leaves, branches, and flowers contain a milky juice which blackens on exposure to the air, and may be used as an indelible ink when applied to cotton or linen. Besides this very acrid milk, the plant, when not exposed to the sun's rays, by growing in the shade, or during the night, exhales a hydrocarburetted gas, which acts very potently on persons of a peculiar susceptibility, when exposed to it. In two or three days after touching or being very near the plant, the skin inflames and swells, being attended with intense burning pain.

The leaves, or an extract of the inspissated juice of this plant, have been recommended in several diseases, particularly herpes, paralysis, and consumption. It is little used in this country.

De Candolle enumerates about ninety species, to which other writers have made additions, but there is reason to believe that many of the new species are merely varieties.

Rhus cotinus, Venus Sumach, or Wild Olive, is a very ornamental shrub, and is one of the European species, growing wild in various districts of the south of Europe. It is made use of, like many other of the species, for tanning, in Italy, and is called *Scotino*. The wood is used by the modern Greeks for dyeing wool, and is said to produce a beautiful rich yellow.

Rhus typhina, Fever Rhus, or Stag's-Horn-Sumach, is found in every part of North America, and its dark red leaves add much to the beauties of an American autumn. The fruit of this plant is exceedingly sour, and on this account it is frequently called Vinegar Plant, and is even used in some parts as a substitute for vinegar.

Rhus vernicifera, Varnish-Bearing Sumach, or Japan Varnish-Tree, is a native of Japan and Nepaul. Its leaves are very large and beautiful, rendering it one of the handsomest of shrubs. According to Thunberg, this is the plant which yields the celebrated Japan varnish.

Rhus venenata, Poison Sumach, or Swamp Sumach, is a native of North America from Canada to Carolina, and also in swampy districts in Japan. It is exceedingly poisonous, so virulent that it is said to affect some persons by merely smelling it. A touch will sometimes produce violent inflammation. It is a beautiful shrub, and well worthy of cultivation, but great care should be taken to prevent its being carelessly handled.

Rhus coriaria, Hide or Elm-Leaved Sumach, is a native of the south of Europe, and is extensively used for the purpose of tanning. It is said that most of the leather made in Turkey is tanned with the bark of this species of Rhus.

Rhus copallina, Gum-Copal or Mastich-Leaved Rhus, is a native of North America from New Jersey to the Carolinas. It is supposed to yield the Gum-Copal of commerce, from which Copal-Varnish is made.

Rhus radicans, Rooting Poison-Oak, or Sumach, is a native of America from Canada to Georgia. Its climbing habit, combined with the beautiful red colour of the leaf during the decline of the year, renders it one of the most picturesque of American plants. It frequently abounds in the forests, where it may be seen covering the tops of the highest trees. It climbs up walls and rocks, and runs upon the ground with equal facility, thus covering everything within the reach of its stems.

RHYME. Johnson derives this word from the Greek *rhythmus* (ῥυθμὸς). Others derive it from the Swedish and Danish *rim*, the Dutch *rym*, and the German *reim*. All the principal European nations use the same word to signify the same thing. Thus, the French have *rime*, the Italians *rima*, and the Spaniards *rima*. The Greek and Roman poets did not use rhyme, and the word rhythmus was applied by both, in its poetical meaning, to the metrical arrangement of syllables, and not to the correspondence of sound in their terminations. Rhyme was not used either by the Celtic or by the early Scandinavian nations. Rhyme, as an accompaniment of verse, cannot be traced farther back among European nations than to the *rymours* of Normandy, the *troubadours* of Provence, the *minnesingers* of Germany, and the monks, who, after the fall of the Roman empire, added rhyming terminations to the Latin metres which were chanted or sung in the church service. Rhyme was early employed by the Italian poets. The 'Divina Commedia' of Dante, the oldest of the great Italian poems, is in alternate rhymes. The early Anglo-Saxon poetry is without rhyme, but it is sometimes used in the later. All the Old English poetry has rhymes, which are rude and imperfect, like the versification.

The English use blank verse as well as rhyme in the ten-syllable measure, but they have not been successful in the omission of rhyme in any other of their forms of verse. There have indeed been a few attempts in lyric measures, of which Collins's 'Ode to Evening,' and Southey's romantic poem of 'Thalaba,' may be taken as favourable specimens. The Germans have been more successful in their unrhymed lyrics. The Italians and Spaniards have lyric measures of many kinds, generally with rhymes, but sometimes without.

RHYNCO'SPORA, a genus of plants belonging to the natural order *Cyperaceæ*. There are two British species; *R. alba*, not uncommon on turfy bogs, and *R. fusca*, a rare species found in the south-west of England and in Ireland. (Babington, *Manual of British Botany.*)

RHYTHM (Ῥυθμὸς, *measure, proportion*), in Music, is *Time;* first, in a limited sense, as in the relative proportions of notes in a single bar; and, secondly, in a more general sense, as in the relative proportion of a number of bars in any given portion of a composition, as in either half of a minuet or of a march. Rhythm is the most important constituent of music; without it inarticulate sounds are unproductive of any musical effect. In melody, that is, a succession of measured sounds, notes are the component parts of a bar, and bars are the component parts of a strain, or musical period, or phrase. The due relative proportion of all these is absolutely necessary in the formation of a good musical composition.

Musical *Rhythm*, in its limited sense, divides a bar into 2, 4, 8, &c., or 3, 6, 12, &c., equal parts; the former is *binary* measure, the latter *ternary*. In its more general sense it divides a strain, a phrase, or by whatever name the subdivisions of a composition may be designated, into equal portions of 2 or 4, &c., or 3, 6, &c., bars, or measures; and some writers have admitted a rhythmus of five bars. We refer the reader, particularly the professional one, to a learned and able disquisition on rhythm in Burney's 'Hist.,' vol. i., p. 71; to Calcott's 'Musical Grammar,' where much practical information from Riepel and other German writers is to be found; to Kollman on 'Harmony;' and more especially to Reicha's 'Traité de Mélodie,' second edition, Paris, 1832.

RIASAN (*Rjasan*), a government of European Russia, is situated between 53° and 55° 40′ N. lat., 38° 18′ and 41° 30′ E. long., and is bounded N. by Wladimir, E. and S. by Tambov, and W. by Tula and Moskwa. The area is 16,208 square miles; and the population in 1846 was 1,365,900. The country is traversed by many small hills and eminences, and the banks of the rivers are high and in some parts rocky. The surface is diversified with forests and groups of trees. The soil in general is a thick layer of fine black mould. The waste lands are susceptible of cultivation. The principal rivers are the Oka, which flows from the government of Moscow, and the Don, which issues from lake Iwanowskoe, on the frontier, both of which rivers receive several smaller streams. The greater part of the canal is in this government, which joins the Volga and the Don by the Oka and the Woronesh. In autumn, winter, and spring, the weather is variable, and in summer hot. The climate is healthy.

The soil is on the whole very fertile, especially in the southern part, where it is drier than in the north, which contains several lakes and marshes. Rye, wheat, oats, barley, millet, flax, and hemp, are cultivated. There is a considerable surplus of corn for exportation. Horticulture is very general among the peasantry, who also grow hops, which are an article of exportation. Apples and cherries are the fruits chiefly cultivated. On the banks of the rivers there are meadows covered with the most nutritious grasses, and good pasturage in the forests, which supply fuel wood. In the plains too there are large tracts very well suited for sheep-walks. Cattle are bred in large numbers. Bees are very generally kept. Fish abound in the rivers. The number of quails is remarkable; many thousands of them are killed in the autumn, salted, and sent in small barrels to all parts of the empire. The minerals are iron-stone, clay, marl, lime, a little free-stone, gypsum, vitriol, and sulphur. The manufactures of glass and hardware are important; woollen, flaxen, and cotton fabrics are also made in considerable quantities. There are also several spirit distilleries, tan-yards, soaperies, rope-walks, &c.

The Archbishop of Riasan and Saraisk is at the head of the Greek clergy. The Mohammedan Tartars have their imams, mosques, and teachers.

Riasan, the capital of the government, situated in 54° 58′ N. lat., 39° 20′ E. long., on the Trubesch, a branch of the Oka, is a well-built town, surrounded with palisades. It is the residence of the military governor of Riasan and Tambov, and of the archbishop; it has a clerical seminary, a gymnasium, several churches, and manufactories of woollen cloth, linen, sailcloth, leather, glass, ironwares, and needles. There are about 17,000 inhabitants.

Saraisk, on the Ossetr, has 5000 inhabitants, and a great trade in cattle. *Kasimov*, on the Oka and the Babinka, has 10,000 inhabitants.

RIBALTA, FRANCISCO, was born at Castellon de la Plana in Valencia, in 1551. At Rome he studied the works of Raphael and Sebastian del Piombo. On his return to Valencia he obtained great reputation. His first public work was the Last Supper, ordered by Archbishop Don Juan de Ribera for the grand altar of the college of Corpus Christi. He died in 1628, at Valencia.

Ribalta's design was correct and vigorous; he was a good anatomist; and his compositions are often grand. His works are or were very numerous in Valencia; the Entombment in the cathedral of that city is an excellent work. There are several of his pictures at Castellon de la Plana and at Madrid.

Juan de Ribalta, born in 1597, an able painter, and of great promise, was the son and pupil of Francisco, but he died in the same year as his father, aged only 31. He painted, in his 18th year, a picture of the Crucifixion, which is numbered among the masterpieces of the Spanish school.

RIBAND, or, according to the common orthography, RIBBON, signifies a long narrow web of silk worn for ornament and use. Ribbons of linen, worsted, gold, or silver thread were formerly included in the term, but it is now generally confined to those made of silk.

Paris, Tours, Lyon, and Avignon, were originally the chief seats of the ribbon trade; the two last cities were rivals until the year 1723, when, partly owing to the regulations which the jealous Lyonnese had prevailed upon the government to make in their favour, and partly to a plague of two years' continuance, the trade of Avignon was ruined, and in great measure transferred to Lyon. At Paris the master ribbon-weavers were incorporated into a company, under the designation of *tissutiers rubaniers* of the town and suburbs of Paris. Figured ribbons were made chiefly at Paris. The ribbons called *double lisse* (double warp), which were considered the richest and best, were made at Tours. Before the revocation of the Edict of Nantes, the ribbon-looms of Tours amounted to 3000; but this measure, which banished the Protestants, banished with them their trade, and both Tours and Lyon suffered severely from its effects; but the trade of Lyon afterwards revived.

According to Dr. Bowring, in 1831 the number of ribbon manufacturers at St. Étienne and St. Chamond was 200. The number of ribbon looms in these towns and the surrounding district, which in 1812 was 9000, had increased to

23,000. Their daily produce was 350,000 ells. There are three kinds of looms in use: 1st, the old unimproved single-hand looms called *basselisse,* employed for plain satins and sarsenets. 2nd, the single-hand loom called *hautelisse,* generally applied to produce large patterns. 3rd, the *à-la-bar,* or *bar loom,* employed in sarsenets, velvets, sarsenet galloons, stout and light satin, and striped gauzes.

There are now few ribbons made at Lyon, many of the ribbon-looms being now employed in weaving shawls. The best ribbons made in France are chiefly for the English market; the home consumption being of the less costly kind.

The making of ribbons and small articles in silk long preceded in England that of broad silk. The trade was principally in the hands of women; and, like a sickly plant of foreign growth, it appears to have constantly demanded props and support, which have however been removed by recent reforms of the tariff. Coventry has become the principal seat of the ribbon manufacture in this country.

The weaving is done on several systems. The *Undertaking System* applies now only to the single-hand trade in the country districts,—Bedworth, Nuneaton, Hartshill, &c.: it is the same that the French have employed since the days of Colbert. According to this plan, the undertaker, or master-weaver, receives the silk dyed in the hank from the manufacturer, and returns it in finished ribbons to his order; all the intermediate operations being included in the price of weaving—two-thirds of which are paid to the journey-hand for his labour. Three-fourths of the single-hand weavers are women, and nearly one-half of the remainder are youths under 20. Boys and girls are considered competent weavers at 16 or 17.

On the *Journey-Work System,* by which the great proportion of the engine-looms in Coventry and its neighbourhood are worked, the manufacturer gives the silk, already wound and warped, to the 'first-hand journeyman,' who is also the owner of the looms. The shoot silk is given in hank, for the winding of which the manufacturer allows 1*d.* per oz., besides the price for weaving, in which is included 'the filling,' or the winding of the shoot on the small revolving pins within the shuttles. About one-fourth of the hands employed on this system are women.

On the *Hand-Factory System* the manufacturer is the owner of the looms. 'The 'journey-hands' work them in the 'loom-shop' of the proprietor, who gets the winding and warping done at his own charge, leaving only the filling to the weaver, which is included in the price of his work, and is often done by very young children. A modern innovation, encouraged by the last system, is the employment of two hands to a loom, the one being occupied uninterruptedly in 'shooting down,' or passing the shuttle and making the ribbon; the other in 'picking up,' or fastening broken threads, picking out knots, &c.

On the *Steam-Factory System* the manufacturer gets every preparatory process done; and by the steam-power one half of the weaving process itself —the shooting down; all that is left to the weaver being the picking up and superintendence.

The *Dutch Engine Loom* was introduced about eighty years ago. In this loom, instead of one piece of ribbon only, several are woven at once, four of the broadest width, or as many as twenty-four of the narrowest. Each warp has a separate shuttle. The batten extends across the whole width of the loom; the shuttles slide within grooves made in the batten; the driver is worked horizontally backwards and forwards by a handle. At each motion the shuttles are propelled by the cross bars of the driver across their proper warps in the corresponding direction. The loom is worked by the hands, and with treadles for the feet, like the single-hand.

The *à-la-Bar,* or *Bar Loom,* was invented and introduced into St. Étienne by two Swiss brothers about seventy years ago. It is a hand power-loom worked by means of a long transverse handle or bar, which extends along the front of the loom, and is connected with wheels on each side, which communicate the motion. The shuttles are driven by means of a rack and pinion across the warps.

Figures on ribbons, as in other fabrics, are chiefly formed by omitting the regular crossing of the warp and shoot in such a manner that a difference of texture shall occur in the web so as to mark out any pattern. This is effected in the single-hand loom by a multiplication of treadles connected with the lisses by which the different portions of warp are alternately raised. Forty treadles have been sometimes required to form an intricate pattern. Small figures produced in this manner are called *Leys.* To execute more complicated patterns, an intricate arrangement of the loom is necessary.

Ribbons are made according to a fixed standard of widths designated by different numbers of pence, which once no doubt denoted the price of the article, but at present have reference only to its breadth. The French distinguish their widths by simple numbers. All dressed ribbons, as satins, gauzes, &c., are made in the loom one-twelfth of an inch wider than sarsenets, in order to allow for the diminution of breadth which results from the lengthwise stretching which they receive in the operation of dressing. Fine gauzes require an allowance of two-twelfths. French fancy ribbons are generally made and sold in *garnitures,* that is, a broad and narrow piece taken together of the same pattern. *Sarsenet and Lutestring* ribbons are made by the simple and regular alternation of the warp and shoot, as in plain cloth, called technically *ground.* By *Grogram* (French *gros-grains*) is meant a variation in the texture, caused by the warp-threads passing over two of the shoots at once, taking up one only: this often finishes the edge of a ribbon.

The figures are frequently produced in a different colour from the ground by the mixture of colours in the warp; the colours being warped separately. In the intervals of the figures the coloured threads are carried along the under side of the ribbon; and it is said to have a double or treble figure, according to the number of colours

passing through each dent. A change of colour in the shoot is effected by the use of different shuttles. In brocades the figure is made by small additional shuttles, thrown in partially across the ribbon as the pattern may require; the connecting threads of shoot being clipped off. By *Damask* is meant the laying of the warp over the shoot to form the figure in the manner of satin. Some fancy ribbons are of plain texture, but varied in colouring; they are shot or woven in shades, stripes, bars, or cheques, called in the trade *Plaids;* these last, which require the shuttle to be changed very frequently, are still made in the single-hand loom. In Shot Ribbons the warp and the shoot are of different colours. *Clouding* is a peculiar management in the dyeing by which a change of hue is produced in the same thread of silk. In *Chiné* ribbons the figures are printed or painted on the warp after it is prepared for the loom, and afterwards woven in by the shuttle. Ribbons are watered by passing two pieces together between two cylinders, one of which has a heater within it. *Galloons* and *Doubles* are strong thick ribbons, principally black, used for bindings, shoe-strings, &c. The narrow widths are called Galloons; the broader, Doubles. *Ferrets* are coarse narrow ribbons shot with cotton, used for similar purposes. In *gold* and *silver* ribbons a silk thread of similar colour is wound round by a flattened wire of the metal, and afterwards woven. Lyon was particularly celebrated for its fabrics of this kind.

The number of persons employed in ribbon-making in Coventry, including winders and warpers, was estimated, in 1838, at 6000 or 7000; and in the rural parishes, at 10,000 or 11,000. It has since varied considerably, according to the fluctuations of the ribbon-trade.

RIBBLE. [Lancashire.]

RIBE. [Jutland.]

RIBEAUVILLE. [Rhin, Haut.]

RIBE'RA, JOSÉ, better known by the surname of *Spagnoletto* (the Little Spaniard), which the Italians gave him, was born Jan. 8, 1588, at San Felipe de Xativa, a large town about ten miles from Valencia. He studied under Francisco Ribalta, but before he was sixteen he left his master, and determined to visit Italy. After spending some time at Rome, he arrived at Naples in 1606, where, under Michael Angelo Caravaggio, Ribera made such progress that he was considered an accomplished master at the age of twenty. At Naples he executed many works for the King of Spain. In 1630 he was elected a member of the Academy of St. Luke at Rome, and made a knight of the order of Christ, by the Pope in 1644. Ribera died at Naples in 1656. Like his master, his style was characterised by broad lights and shades. The Spasms of Ixion, St. Bartholomew under the Butcher's Knife, the Torments of Sisyphus, Tantalus, and Prometheus; Laocoon and his Sons attacked by Serpents, were his favourite subjects. His principal pictures are in the Royal Museum at Madrid, in the Escurial, and at Naples.

RIBÉRAC. [Dordogne.]

RIBES (a name formerly given to a species of *Rheum*) is a genus of plants forming the natural order *Grossulaceæ*. As this genus is the only one in the order, its characters, geographical range, and affinities are described with the order. It is well-known as producing the currant and gooseberry, and also for affording many of the ornamental shrubs of our gardens.

R. Oxycanthoides, Hawthorn-Leaved Gooseberry, is a native of rocky districts in Canada, and bears a fruit very much resembling that of the common gooseberry, both in appearance and taste.

R. grossularia, Common Gooseberry. This plant is probably the parent of many of the other recorded species of Ribes. It is found wild in almost every part of England and Scotland, growing on old walls, in hedges, and woods, though a question might be raised as to its being aboriginal in this island. It seems to be truly indigenous in France, Germany, and Switzerland; and, according to Dr. Royle, is found on the Himalayas, and on the banks of the Ganges. It also grows in North America, on rocks near the Falls of Niagara, and in many other places.

This plant does not appear to have been known to the ancients; and the earliest author who mentions it is Matthiolus, an Italian botanist. It was recorded as existing in England by Turner, Parkinson, and Gerard; but Ray is the earliest writer who mentions it as a cultivated species. The Dutch were the first to cultivate the gooseberry successfully, but even up to the time of Miller it seems to have gained very little repute in England as a fruit for the table. From its extensive cultivation, it has received a great variety of names. In Cheshire and the north of England it is called *Feaberry*, in Norfolk *Feabes*, both of which names are corruptions of Feverberry, as, according to Gerard, it was at one time considered a specific against fevers. *Grozzer* is a common name for it in Scotland, which seems to be derived from the French name *Groseille à Macquereau*, which is again derived from the Latin *Grossularia*, and the use of the fruit as a sauce with mackerel. Its common name, *Gooseberry*, is derived from Gorse-Berry, because its prickles resembled those of the furze or gorse. Some derive this name from its berries being used as sauce for geese.

There are numerous varieties of this plant recorded, which chiefly vary in the extent, size, and number of their prickles, and in the shape and size of their fruit and flowers.

R. rubrum, Common Red Currant. The name currant seems to be derived from the similarity of the fruit to the Corinth raisin, or small grape of Zante, which are commonly called Corinths, or Currants. It is a native of Europe and Siberia, and the northern parts of North America to the mouth of the Mackenzie, and is found in mountainous districts in the north of England and Scotland. Like most plants that are easily disseminated and occupy varied elevation, latitude, and soil, this species is subject to many varieties.

The currant is not mentioned by Greek and Roman writers, but it is scarcely possible that its beautiful red and sweet berries should have been

neglected by the people amongst whom they grew. In France they were cultivated long before the gooseberry, but were first produced in perfection by the Dutch. Gerard mentions that they were cultivated in gardens in his time. Till a recent period very few varieties were known, but several, white as well as red, have been since introduced.

R. nigrum, Black Currant. The peculiar strong smell of the leaves of this plant is very characteristic. The black currant has the same geographical range as the red, but is found more abundantly in the north than in the south of Europe. It is now common in Great Britain, but is probably not indigenous. It is found in Siberia, on the Caucasus, and in Sweden. It is indigenous in the woods of Russia as far as St. Petersburg, and in this district the fruit is found green, yellow, or even white. Species of Ribes are also found in India and South America with black fruit.

The fruit of the Black Currant is not in so great repute as the red, and is comparatively of modern introduction. It is sometimes used as a medicine. The leaves and fruit are diuretic.

R. sanguineum, Bloody or Red-flowered Currant, is a native of the north-west coast of America, and has been extensively cultivated in Great Britain.

RIBGRASS. [PLANTAGINACEÆ.]

RICARDO, DAVID, was born in London April 19, 1772. His father, a native of Holland, had been for several years a member of the Stock Exchange in London; and designing his third son, David, for the same occupation, gave him a good but plain commercial education in Holland. In 1793 he formed a matrimonial alliance displeasing to his father, by reason of his religious scruples, the elder Mr. Ricardo having been born of Jewish parents, and continuing to profess their faith until his death. This caused their separation as regarded business. Mr. Ricardo continued to be a member of the Stock Exchange until 1818.

Notwithstanding his close attention to business, he continued to devote much time to study and to scientific pursuits. He was one of the original promoters of the Geological Society of London; he also acquired a knowledge of chemistry and mathematics. Later in life the powers of his mind were almost wholly devoted to the elucidation of questions connected with political economy. In the beginning of 1819 Mr. Ricardo was returned to Parliament by the Irish borough of Portarlington, which he continued to represent until his death. During each of the five sessions in which he sat in parliament, his name often appears as a speaker; and in the latest two years of the series (1822 and 1823) his addresses were very frequent. On every point connected with finance and political economy his opinion had great weight in the house. At the close of the session of 1823 he retired to his estate of Gatcomb Park in Gloucestershire, and died Sept. 11, in the same year, of an inflammation of the brain.

Mr. Ricardo first appeared as an author during the discussions that led to and accompanied the famous Bullion Committee in 1810. His pamphlet, which was entitled 'The High Price of Bullion a Proof of the Depreciation of Bank Notes,' speedily passed through four editions, and occasioned the publication of several replies. His next publication was entitled 'A Reply to Mr. Bosanquet's Practical Observations on the Report of the Bullion Committee.'

In 1815 he published 'An Essay on the Influence of a Low Price of Corn on the Profits of Stock,' but the essay is chiefly remarkable for the doctrine which it propounds concerning Rent. The following year produced 'Proposals for an Economical and Secure Currency, with Observations on the Profits of the Bank of England.' His great work, 'On the Principles of Political Economy and Taxation,' was published in 1817, and was at once pronounced the most valuable contribution made to economical science since the days of Adam Smith. In 1822 appeared his tract entitled 'On Protection to Agriculture,' in which he exposed certain fallacies and prejudices of the landed proprietors. The only remaining work of Mr. Ricardo was a pamphlet in recommendation of a national bank, found among his papers and published after his death.

RICAUT. [RYCAUT.]

RICCI or RIZZI, SEBASTIA'NO, born at Cividal di Belluno, near Trevisano, in the Venetian state, in 1659 or 1660, was placed early under the tuition of Frederigo Cervelli, the painter, at Venice. He resided for some years at Florence and Rome, and ultimately made a tour of the whole of Italy and various other parts of the continent, executing pictures at any price, wherever he obtained commissions, and leaving behind him a reputation almost universal. Being invited to England by Queen Anne, he travelled through France, and at Paris was made a member of the Academy of Painting. During his residence in England, which lasted ten years, he was extensively employed. On quitting this country he returned to Venice, where he was constantly occupied on pictures for France, Spain, Portugal, and Sardinia. Ricci, in common with Lucca Giordano, possessed the power of imitating with great exactness the style of the great masters who preceded him. In many of his works he was assisted by his nephew Marco Ricci, who resided with him in England. Sebastiano died at Venice May 5, 1734. Amongst the most noted of his productions may be enumerated the Massacre of the Innocents, at Venice; the Rape of the Sabines, at Rome; at Bergamo, Saint Gregory supplicating the Virgin in favour of the Souls in Purgatory; at Vienna, several ceilings of the imperial palace, and an Assumption of the Virgin, at the church of St. Charles. Among the works which he executed in England may be mentioned the Ascension, in the cupola of Chelsea Hospital; the Staircase of Montagu House, afterwards the British Museum, but now demolished; and the chapel at Bulstrode, for the Duke of Portland.

RICCIARELLI, DANIELE, generally called *Daniele di Volterra*, from the place of his nativity, was born in 1509. He appears to have first studied painting at Siena, under Antonio Razzi,

called Il Sodoma, and afterwards under Baldassare Peruzzi. At Rome he was employed as an assistant to Pierino del Vaga in the Vatican, and in the Capella Massimi, in the church of the Trinità del Monte. Michael Angelo gave him designs for the works which he executed in the Farnesina, and for others of his best performances. The principal monument of his fame was the series of frescoes in the church of La Trinità del Monte, representing the History of the Cross, on which he was employed seven years. The most celebrated of these was the Descent from the Cross, in which the figures of the Saviour and the Virgin are said to have been painted by Michael Angelo. These frescoes were destroyed by the French in an endeavour to remove them. On the death of Pierino del Vaga, in 1547, Ricciarelli was recommended by Michael Angelo to Pope Paul III. as superintendant of the works in the Vatican, of which, and of his pension, he was deprived by Julius III. He died at Rome in 1566.

RICCIO, DOME'NICO, called *Il Brusasorci*, was born at Verona in 1494. He was the pupil of Giolfino, and is supposed also to have studied under Titian, in Venice, where he at least studied his works and those of Giorgione. Among his first and principal works in Verona were the frescoes of the Palazzo de' Murari, near the Ponte Nuovo. In the Palazzo Ridolfi he painted the celebrated cavalcade of Clement VII. and Charles V., at Bologna, on the consecration of the Emperor; these frescoes are still in preservation. Riccio painted also many excellent works in oil. Venuses and nymphs were favourite subjects with him. He died in 1567.

Felice Riccio, or *Brusasorci*, his son, was also a painter; but in a different style from his father: more delicate, but with less power. He was a good portrait-painter. He died in 1605, aged 65. His sister *Cecilia Brusasorci* was also an excellent painter of portraits. *Giovanni Battista Brusasorci*, another son of Domenico, was painter to one of the German emperors.

RICCIO'LI, GIOVANNI BATTISTA, born at Ferrara in 1598, entered into the Society of the Jesuits in 1614, and was chosen teacher of philosophy, rhetoric, poetry, and theology, in the colleges of their order at Parma and Bologna; but his inclination leading him to the study of geography and astronomy, he gave up his appointments.

His first published work was the 'Almagestum Novum' (1653), which constitutes a treatise on astronomy. The learned world was then divided between the followers of Aristotle and the disciples of Copernicus in their opinions respecting the system of the universe. In the 'Almagestum' Riccioli having explained the ideas of the last-mentioned philosopher concerning the movement of the earth, offers a long series of objections to them, which, with a brief reply to each, may be seen in Delambre ('Histoire de l'Astron. Mod.,' tom. i., p. 672, &c.) Nevertheless, the admiration constantly expressed for Copernicus, and even the manner in which the objections to his theory are stated, have led to a belief that this learned Jesuit was a Copernican in his heart.

In 1661 Riccioli published a work on geography and hydrography, in which is given an account of the operations which, in conjunction with P. Grimaldi, he had carried on in order to determine the length of a degree of the terrestrial meridian.

Lastly, in 1665, Riccioli published his 'Astronomia Reformata,' a work in which he treats of refractions and parallaxes, and describes the instruments which he used to determine the places of the stars.

This writer, who is considered as having been less useful to mankind by his discoveries than by the care which he took to record those of his predecessors, died in 1671.

RICE. [Oryza.]

RICE-BIRD, one of the names of the Paddy Bird, Paddee Bird, or Java Sparrow (*Loxia oryzivora* of Linnæus).

This well-known bird, whose plumage is well described by Buffon as being so nicely arranged that no one feather passes another, whilst all appear to be covered with that kind of bloom which is visible on plums, giving them a beautiful tint, has the bill very much developed; indeed, with the exception of *Pyrenestes* and perhaps *Coccothraustes*, this finch is the most remarkable of the race for the size and power of that organ.

Description.—Bloomy lead-coloured, head and tail black, bill red, belly obscurely rosy, cheeks in the male snowy, legs flesh-coloured.

Rice-Bird (*Loxia oryzivora*).

Locality, Habits, &c.—In Java, where it is called Glate, and the other parts of Asia where it is found, it has a very bad reputation on account of the ravages which it commits in the rice-fields with its powerful and sharp bill. It is often brought alive to this country, and confined in aviaries for the sake of its elegant shape and graceful colouring: its song, which is short and monotonous, does not much recommend it. This species must not be confounded with the Rice-Bird of America, *Emberiza oryzivora*, Linn. [Bob-o-Link.]

RICE-MILL. When rice has been cultivated and gathered [Oryza], some sort of mechanism is requisite for the removal of the husk. The Chinese and Hindoos beat the grain in a kind of rude mortar of stone or earthenware, with a conical stone attached to a lever worked by the

hand or foot. Sometimes several such levers are moved by arms projecting from the axis of a water-wheel. This process being uncertain and tedious, the preference has been given of late to a kind of mill, in which the stones are placed at such a distance asunder as to detach the shell without crushing the grain; the stones being inclosed in a case which prevents the dispersion of the rice by the rapid rotation of the machine. The rice is thrown out of the case by an opening in its side, and conducted over a sieve that separates the dust; after which it is made to fall in a gentle stream exposed to a current of air, produced by revolving fanners, and is thereby separated from the husk. After the removal of the husk, the grain is exposed to the action of a whitening machine, which removes the inner cuticle, or red skin, remaining on the surface of the grain.

One of the English methods consists in breaking the husk by mill-stones, and removing the red cuticle by beating or triturating in mortars; the latter operation being aided by mixing a quantity of the husks, well dried, with the grain, which obviates an inconvenience occasioned by the glutinous character of the red coating. The refuse matter and the broken grains are then separated by a peculiar kind of screen, and the rice is finally cleaned and polished by rotating in a machine. In another method, the first operation is performed between one millstone and a piece of wood of precisely similar shape, and the subsequent removal of the dark pellicle is effected by rubbing between flat wooden surfaces covered with sheepskin. In a third method, the paddy is allowed to enter the upper end of an inclined cylinder by a hopper, and the mutual attrition of the grains, as they pass between bars which are revolving in the opposite direction, causes the separation of the husks, which are removed by a current of air as the grain falls into a bin under the lower extremity of the cylinder.

RICEYS, LES. [AUBE.]

RICH, CLAUDIUS JAMES, was born March 28, 1787, near Dijon in Burgundy, and, while yet an infant, was carried to Bristol, where he spent the earlier years of his life. He received a good education, and was early distinguished by his extraordinary powers in the acquisition of languages. It is said that he could read five of the eastern languages before he was fifteen years of age. He was presented with a writership in the Bombay establishment by Mr. Parry, the chairman of the board of directors, in consequence of the strong recommendation of Sir Charles Wilkins. After perfecting himself in the Turkish language at Constantinople and Smyrna, and in the Arabic in Egypt, he proceeded by way of Bassora to Bombay, where he arrived in September, 1807. On his arrival at Bombay, he resided at the house of Sir J. Mackintosh, to whom he had been introduced by the Rev. Robert Hall previous to his departure from England. In the following year he married the eldest daughter of Sir J. Mackintosh, and was shortly afterwards appointed the East India Company's resident at Bagdad, where he remained for about six years. He formed a rich collection of Oriental manuscripts, and also of medals and coins, and of the gems and engraved stones found at Babylon, Nineveh, Ctesiphon, and Bagdad. In 1813 Mr. Rich visited Constantinople and Paris. In 1815 he returned to Bagdad, where he resumed his former pursuits. He died of the cholera at Shiraz, in October, 1821.

Rich's two Memoirs on Babylon, a site which he twice visited, were the only writings which he published in his life-time, with the exception of a few articles in the 'Mines de l'Orient:' but he left behind him a considerable number of papers on various subjects. His collection of Oriental MSS., of coins, and antiquities, was purchased by parliament for the British Museum. Mr. Rich, during his second residence at Bagdad and on his various excursions, was unwearied in his astronomical observations. He has left a very complete series of eclipses of Jupiter's satellites, and numerous altitudes of stars and lunar distances, most of which are computed, and the results in latitudes and longitude deduced. It is probable that a recalculation of the observations correcting the errors of the Ephemerides by contemporary observations at the standard observatories, would improve the geography of the countries through which he travelled, though with a considerable amount of computation. Unfortunately his chronometer was so indifferent that the partial results cannot be combined. The emersions of Jupiter's first satellite, observed at Bagdad, when so computed, throw the longitude a little to the east of Beauchamp's and Murphy's determinations. This seems to show that, from the clearness of the atmosphere or superior quickness of eye, Mr. Rich anticipated other observers, and saw the reappearances earlier. His zeal as an observer may be estimated from the fact that when taking the sun at Bagdad the metal of his sextant was frequently too hot to be touched without pain; and after the most fatiguing marches, and while labouring under severe indisposition, he seized every favourable opportunity of fixing his position astronomically.

RICHARD I., King of England, surnamed *Cœur de Lion*, was the third son of Henry II. and his queen Eleanor, and was born at Oxford, in the king's manor-house there, afterwards the monastery of the White Friars, in September, 1157. The earlier part of the life of Richard has been already noticed. [HENRY II.]

After the death of his father, Richard made no particular haste to come over to England; but, contenting himself with ordering his mother Queen Eleanor to be liberated from confinement, and to be invested with the regency of the kingdom, he first proceeded to Rouen, where, July 20, 1189, he was formally acknowledged as Duke of Normandy, and he did not arrive in England until August 13. His coronation, from which the commencement of his reign is dated, took place in Westminster Abbey, Sept. 3. It was on occasion of that ceremony that a furious riot broke out against the Jews in London, which spread in the course of the next six months through most of the great towns of the kingdom.

Richard had in the meantime joined the Third Crusade, and left England Dec. 11, 1189. Proceeding to Normandy, he united his forces with those of Philip Augustus in the plain of Vezelai, July 1, 1190. The Crusaders proceeded, by different routes, to Messina, where they remained till the end of March, 1191. During their stay Richard compelled Tancred, who had usurped the crown of Sicily, to relinquish the dower of his sister Joan, the widow of William, the late sovereign, and to pay him besides 40,000 ounces of gold. In return he betrothed his nephew Arthur, the son of his next brother, Geoffrey, to Tancred's infant daughter, and formed a league offensive and defensive with the Sicilian king, a connection which afterwards cost him dear, for it was the source of the enmity of the Emperor Henry VI. After the dispute with Tancred had been settled, the latent rivalry of Richard and Philip broke out in a quarrel about the princess Adelais, the sister of Philip, to whom Richard had been betrothed, but whom he now forsook for Berengaria, the beautiful daughter of Sancho VI. of Navarre. This quarrel, which however was ultimately settled by certain concessions on the part of Richard, caused the separation of the two kings, and Philip proceeded to Palestine alone.

Isaac, the king of Cyprus, having ill used the crews of some English vessels which had been cast upon his coasts, Richard made an attack upon that island, which ultimately surrendered to him. Having married Berengaria, Richard set sail from Cyprus on June 4, 1191, with a fleet consisting of thirteen large ships, called busses, fifty galleys, and a hundred transports; and on the 10th he reached the camp of the Crusaders assembled before the fortress of Acre, which surrendered July 12. This great event however was immediately followed by an open rupture between Richard and King Philip, which caused Philip to return to France.

Richard performed prodigies of valour in the Holy Land; but, although a signal defeat of Saladin, Sept. 7, was followed by the capture of Jaffa and some other places of less importance, Jerusalem, so far from being taken, was not even attacked. At last, Oct. 9, 1192, Richard set sail from Acre in a single vessel, his fleet, having on board his wife, his sister, and the daughter of the captive King of Cyprus, having put to sea a few days before. The three ladies got safe to Sicily; but the first land the king made was the island of Corfu, which he took about a month to reach. He left Corfu about the middle of November; but, after being a few days at sea, he was compelled by a storm to land on the coast of Istria, at a spot between the towns of Aquileia and Venice. After encountering many dangers he reached Erpberg, Dec. 21, where he fell into the power of Leopold, Duke of Austria, who transferred him to the custody of the Emperor Henry IV. The captive king was now imprisoned closely in a castle in the Tyrol. In this state he remained about three months. At length Longchamp, bishop of Ely, and chancellor, who had been entrusted with the government of England in conjunction with the Bishop of Durham, having discovered Richard's place of confinement, prevailed upon the Emperor to allow the royal prisoner to be brought before the diet at Hagenau, April 13, 1193. Here Richard defended himself with so much eloquence against the several charges made against him, that Henry found himself compelled by the general sentiment of the diet to agree to enter upon negociations for his ransom. Notwithstanding the insidious opposition both of his brother John and Philip of France, Richard was at last liberated, Feb. 4, 1194, after 70,000 marks had been actually paid to the Emperor, and hostages given for the payment of 30,000 more. Richard arrived in England, March 13, where his first care was to check the career of John. [JOHN.] He was again crowned at Winchester, April 17; a ceremony which was considered necessary, most probably on account of his having while in Germany formally resigned his crown, and consented to hold it as a fief of the Empire. On the 2nd of May following, Richard having, with his characteristic activity, employed almost every moment since his arrival in raising an army, again set sail for Portsmouth, his whole soul bent on chastising the king of France. But the war, though it lasted till near the end of 1195, during which Richard was generally successful, was distinguished by few remarkable events. Meantime, Hubert, Archbishop of Canterbury, assisted by Longchamp, presided over the government at home with great ability. The large sums however which they were obliged to raise by taxation provoked much popular dissatisfaction; and the third year of the king's absence in particular was distinguished by the remarkable commotion excited by William Fitz-Osbert, styled Longbeard, the Advocate and King of the Poor, as he was called, and who is said to have had above fifty thousand of the lower orders associated with him by oaths which bound them to follow whithersoever he led. This extraordinary man was hanged at Smithfield, April, 1196, and was long venerated as a martyr.

The war between Richard and Philip broke out again in 1197. A truce at the end of the year suspended hostilities for a space, but the war was renewed on its termination, and in this campaign (1198) Richard gained one of his greatest victories, near Gisors, when Philip in his flight fell into the river Epte, and was nearly drowned. After this, by the intervention of the pope's legate, a truce was concluded between the two kings for five years. On March 26, 1199, as Richard was engaged in reducing the castle of Chaluz, the stronghold of Vidomar, Viscount of Limoges, who had refused to surrender a treasure found on his estate, to which the king laid claim in right of his feudal superiority, Cœur de Lion was struck in the left shoulder by an arrow, of which wound he died.

Richard I. had no issue by his wife Berengaria, and was succeeded on the throne by his youngest brother, John.

The character of Richard is one of course not to be judged without reference to the general manners of the age in which he lived. His intellectual powers, both natural and acquired, were of

a high order; and he was renowned in wit, in eloquence, and in song. A few of Richard's poetical compositions have been preserved. 'La Tour Ténébreuse,' 1705, contains a love-song in Norman-French, and another chanson in mixed Romance and Provençal, said to be the joint composition of Richard and his favourite minstrel Blondel de Nesle, and to be that by which Blondel, according to the well-known story, now generally believed to be a fiction, discovered his master's prison.

RICHARD II., King of England, the second but only surviving son of Edward the Black Prince, eldest son of King Edward III., was born at Bordeaux, April 3, 1366. He succeeded to the throne on the death of his grandfather, June 22, 1377. The king, being a minor, the powers of government were vested in twelve counsellors, who were appointed to assist, in other words to direct and control, the chancellor and treasurer. The principal event of the first three years of this reign was the war with France, which was prosecuted in Brittany under the conduct of the Earl of Buckingham; but the death of Charles V., in September, 1380, having been speedily followed by a peace between the Duke of Brittany and the new French regency, Buckingham, now finding an enemy in his former ally, was glad to return home with his army, in April, 1381.

Meantime, in England, the crown and aristocracy were contending against the growing power of the House of Commons, which was especially asserting the right of taxation; while the labouring classes were menacing both powers in their endeavour to gain freedom for themselves. The explosion of these various elements was provoked by the state of pecuniary necessity to which the crown was reduced in the years 1379 and 1380. First, to induce the commons to grant the money that was wanted, it was found necessary, after a short struggle, to submit to their demands of not only being allowed to inspect the accounts of the royal treasury, but even of appointing the king's ministers. Then, in December, 1380, the famous capitation tax was imposed, which gave rise to the rebellion of Wat Tyler in the summer of the year following. The career of this demagogue was suddenly terminated by the bold hand of Sir William Walworth, the lord mayor, who, when Tyler, coming forth from his men, rode up to the king in West Smithfield, plunged a dagger into his throat. In a few weeks the rising was completely suppressed in all parts of the kingdom. The victory was followed by numerous executions on the scaffold, amounting, it is stated, in all, to about 1500 persons, two priests, named Jack Straw and John Ball, and other leaders, being among the number. All the promises that had been made to the multitudes, while they had arms in their hands, were broken.

On Jan. 14, 1382, Richard was married to Anne of Bohemia, daughter of Charles IV., the late Emperor of Germany. The next two years were filled up with an unsuccessful war against the French in Flanders, conducted by Henry Spencer, the young and fighting Bishop of Norwich. In 1385 the war with France was transferred to Scotland; and in the summer of that year Richard, for the first time, appeared at the head of his army, which penetrated as far as Aberdeen, having on its way set fire to Edinburgh, Dunfermline, Perth, and Dundee, without having seen the face of the enemy. In Feb. 1388 the 'wonderful parliament,' as it was called, met, over which the king's uncle, Thomas, duke of Gloucester, had so much influence that it banished the royal favourites De Vere, duke of Ireland, and De la Pole, earl of Suffolk, and completely put down the king's party for a time. But at a great council held in May, 1389, Richard, unexpectedly intimated that, being now in his twenty-second year, he intended to take the management of affairs into his own hands; and the suddenness of the movement secured its success for the moment. Gloucester found it necessary to retire into the country; but was subsequently permitted to return. On the death of his queen, in 1394, Richard solicited the hand of Isabella, the daughter of Charles VI. of France. After many delays, the treaty of marriage was finally arranged in October, 1396.

This French marriage is believed to have materially contributed to the domestic revolution that followed. In the beginning of July, 1397, the Earl of Warwick and the Earl of Arundel, the friends and confederates of Gloucester, who had opposed the marriage, were suddenly arrested by order of the king; and a few days later Gloucester himself was seized, and conducted a prisoner to Calais. A parliament was then called, which ratified all that had been done, and impeached the three peers, and also Arundel's brother, the Archbishop of Canterbury, of high treason. The Archbishop and Warwick were banished for life; Arundel was beheaded on Tower Hill; and when an order was sent to the governor of Calais Castle to bring up his prisoner Gloucester, the answer returned was that he had died, and few doubted that he had been made away with by the king's orders. It was immediately after this affair that Bolingbroke, the son of John of Gaunt, was raised to the dignity of Duke of Hereford; Richard's half-brother, Sir John Holland (the son of his mother by her second husband), being at the same time made Duke of Exeter. The subservient parliament, before it separated, devolved the whole power of government and legislation upon a commission of twelve peers and six commoners, all devoted to the king; and having also obtained from them the grant of a revenue for life, Richard might now be considered as almost an absolute sovereign.

This state of things however did not last long. Intoxicated by the success of his schemes, Richard now set no bounds to his exactions and extravagance; and, instead of being satisfied with the discomfiture of his enemies, he devised means for ridding himself of others whom he still apprehended to be dangerous. The accusation brought by the Duke of Hereford against the Duke of Norfolk soon gave him an opportunity. (This accusation, and the events which followed, will be

found noticed under HENRY IV.) When Richard landed at Milford Haven, Aug. 5, 1399, from Ireland, where he had been putting down an insurrection, the greater part of the army deserted. Richard then disguised himself as a Franciscan friar, and, accompanied by the Duke of Exeter and some others of his friends, fled to Conway. The Earl of Northumberland came to him from Bolingbroke, Aug. 18, and induced him to accompany him to Flint Castle, where, on the following day, Bolingbroke presented himself at the head of about 80,000 men. The unhappy king proceeded to Chester in the train of his conqueror, and thence was carried to London, where he was lodged in the Tower. Here, Sept. 29, he consented to read a renunciation of the crown before a deputation of prelates, barons, knights, and lawyers. On the next day the two houses of parliament met together in Westminster Hall, and voted his deposition, immediately after which the Duke of Lancaster was unanimously recognised as king. [HENRY IV.]

Richard did not long survive his dethronement. All that is further known is, that, in the following February, rumours were spread that he was dead, and that in the beginning of March his body, or what was declared to be such, was brought with funeral pomp from Pontefract Castle to London, and there exhibited openly to the people. It was reported by some that he had starved himself to death; by others that he had been starved by his keepers; by others that he had been violently made away with by Sir Piers Exton, assisted by other assassins.

Of the alterations made in the statute law during the reign of Richard II., the most important was the extension of the former acts against provisors, or persons obtaining papal presentations to benefices before they were vacant, by a series of new acts, and especially by the 16 Ric. II., c. 5, commonly called the Statute of Præmunire. The right of impeachment and prosecution by the commons in parliament, which had been first asserted in the latter years of Edward III., was finally established in this reign by the impeachment of the Earl of Suffolk, the late chancellor, in 1386.

Richard II. had no issue by either of his wives (his second indeed was only a child of ten years of age at the time of his death).

RICHARD III., King of England, youngest son of Richard, duke of York [EDWARD IV.], was born Oct. 2, 1452, at Fotheringay Castle in Northamptonshire. Soon after the accession of Edward IV., Richard was created Duke of Gloucester, made a Knight of the Garter, and appointed Lord High Admiral, though as yet only in his tenth year. In 1469 he was made one of the wardens of the Scottish Marches; in 1470 he fled with the king, his brother, to Flanders on the sudden restoration of Henry VI. by the Earl of Warwick; in 1471 he commanded the van of his brother's army at the battle of Barnet; and he assisted in gaining for Edward his next and crowning victory of Tewksbury. He and his brother Clarence are asserted to have been the actual murderers of Henry's son Prince Edward, after the battle. To

Gloucester also was popularly ascribed the murder of Henry himself in the Tower a few weeks after. [HENRY VI.] The following year the Lady Anne Nevil, daughter of the Earl of Warwick, and widow of Prince Edward, was prevailed upon to give him her hand.

In 1478 Gloucester took a foremost part in the attainder and destruction of his brother Clarence, whose removal placed him next after the king's issue in the order of succession to the throne. In 1482 he commanded an expedition against Scotland, and was still in command of his army on the borders, when the death of his brother took place April, 1483.

From his arrival in London to the disappearance of the young king and his brother, towards the end of June [EDWARD V.], Gloucester, who had taken possession of the royal person, and now called himself Lord Protector, kept his residence at Crosby Place in the City, where he held frequent conferences with his confidants. All those whom he suspected of being unfriendly to him he caused to be arrested; and Earl Rivers, Lord Grey, Sir Thomas Vaughan, and Sir Richard Hawes, were executed on charges of treason. The Duke of Buckingham was his great adherent. It was Buckingham who, after the young princes had been denounced as bastards, caused the crown to be offered to Richard, June 23, 1483, which Richard accepted, after some feigned reluctance, in obedience, as he said, to the popular voice. Indeed the people seemed everywhere in his favour—being perhaps awed by his reckless determination, as they were charmed by his newly-assumed clemency and condescension. It was while receiving congratulations in the north that Richard received intelligence of the defection of Buckingham, and the organisation of a formidable insurrection in favour of his two nephews; but on the death of the princes being known, the plans of the conspirators were changed, and the crown was offered to Henry, earl of Richmond, who however, after having reached the coast of Devon, did not venture to disembark. Buckingham was deserted by a force of Welshmen that he had raised at Brecon, and, falling into the king's hands, had his head struck off in the market-place of Salisbury.

A parliament was now summoned, which, having met on the 23rd of January, 1484, immediately passed an act declaring Richard to be undoubted king of the realm of England 'as well by right of consanguinity and inheritance, as by lawful election, consecration, and coronation,' and bastardising the issue of the late King Edward IV. by Elizabeth Rivers. This act is known by the name of the 'Titulus Regius,' and is the earliest of what are called the Private Acts, none of which are given in any of the printed collections of the statutes. The 'Titulus Regius' however has been printed by Sir Robert Cotton, in his 'Abridgment of the Rolls of Parliament.' But various acts of public utility were also passed by this parliament for the amendment of the criminal law and the regulation of commercial affairs.

Richard had the preceding year concluded a

peace with Scotland for three years; but at home the aspect of things was becoming more unsatisfactory every hour. At last, on Aug. 7, 1485, the Earl of Richmond landed at Milford Haven; and on the 21st of the same month the result of the battle of Bosworth deprived Richard at once of his crown and his life. [HENRY VII.]

Both the character of Richard III. and many of the events of his reign have been subjects of dispute among modern writers, some of whom have gone the length of attempting to make out that most of the crimes imputed to him are the mere fabrications of his enemies; and it is clear that his bad qualities have been exaggerated.

RICHARD PLANTAGENET, Earl of Cornwall, and titular King of the Romans and Emperor of Germany, was the second son of John, King of England, and was born Jan. 5, 1208. He was created Earl of Cornwall by his brother Henry III. in 1226; and he figures as one of the leading personages throughout that turbulent and distracted reign, showing generally much moderation and good sense in his endeavours to assuage the stormy contentions between the king and the barons. Although he showed some military talent on more than one occasion, his abilities on the whole seem to have been, like his politics and his morals, not of a very marked character. The most remarkable incident in Richard's history is his election as King of the Romans in 1256. This honour he is believed to have owed entirely to his great wealth, which enabled him to bribe several of the electors. Richard was crowned at Aix-la-Chapelle, and occasionally exercised such of the Imperial rights as could be exercised by a stroke of the pen or the expenditure of a little sealing-wax; but he never enjoyed any real authority in Germany, nor indeed did he show himself much in that country. He was taken prisoner by De Montfort, at the battle of Lewes, in May, 1264, and was confined in Kenilworth Castle for more than a year. He died in his house at Berkhampstead, April 2, 1272.

RICHARD DE BURY was born in 1287, upon the estate of his father, Sir Richard Angerville, or in Bury St. Edmunds. He went to Oxford, and on completing his studies received the appointment of tutor to Prince Edward (afterwards Edward III.), with the office of receiver of his revenues in Wales. He rendered essential services to the prince during his early troubles, and when Edward came to the throne was rewarded by a rapid advancement to dignities both in church and state. He was first made cofferer to the king, then treasurer of the wardrobe and clerk of the privy seal. He also held two rectories, six prebendal stalls, the archdeaconries of Salisbury and Northampton, the canonry of Weston, and the deanery of Wells. He visited Rome twice, as legate to Pope John XXII., and on his return from his second mission, he was made Bishop of Durham by the king and the pope, although the prior and chapter of Durham, who had the right of election, had chosen another person. In 1334 De Bury was made chancellor and high treasurer of England. Within the three following years he was thrice at Paris as ambassador to the King of France, upon the subject of Edward's claim to the crown of that kingdom, and in the same character he visited Antwerp and Brabant. But though accident made him a statesman, he was a scholar from habit and inclination. In early youth he delighted in the society of learned men, but of books 'in which wisdom is contained' he was an enthusiastic lover, and the most distinguished collector of his age. It is said that he finally became possessed of more books than all the other bishops of England put together.

The best account of his researches and of his life will be found in the 'Philobiblon,' a small treatise written by himself. It was first printed at Cologne, in 1473; afterwards at Speyer, in 1483; Paris, 1500; Oxford, 1599; and in the collections of Goldast and Schmid: a limited impression of an English translation was published in London, 1832. There is no other known work by him extant, though one is mentioned under the title of 'Orationes ad Principes,' and some letters are spoken of. He died at Auckland, April 14, 1345, and was buried in the cathedral of Durham.

RICHARD OF CIRENCESTER, or *Ricardus Corinensis* (sometimes called the Monk of Westminster), a monkish historian of the 14th century, so named from his being a native of Cirencester in Gloucestershire. He entered the Benedictine monastery of St. Peter, Westminster, in 1350; his name occurs in various documents in 1387, 1397, and 1399. He obtained a licence from his abbot to visit Rome in 1391, the original of which is still in existence. It is supposed that he undertook this journey between 1391 and 1397, for he appears to have been confined in the abbey infirmary in 1401, and to have died in that or the following year. His work entitled 'Historia ab Hengista ad ann. 1348' is in two parts. His theological works were, 'Tractatus super Symbolum Majus et Minus,' and 'Liber de Officiis Ecclesiasticis.' But he is chiefly known from his celebrated treatise entitled 'De Situ Britanniæ,' which lay hid in manuscript till 1747, when it was discovered by Charles Julius Bertram, professor of the English language at the Royal Marine Academy at Copenhagen, who sent a transcript of the whole to Dr. Stukeley, with a copy of the MS. In 1757 Dr. Stukeley published an analysis of the work, with the 'Itinerary;' and other particulars may be seen in the second volume of Dr. Stukeley's 'Itinerarium Curiosum,' and in Whitaker's 'Manchester.' In the same year the original was published at Copenhagen by Professor Bertram, with the remains of Gildas and Nennius, under the title 'Britannicarum Gentium Historiæ Antiquæ Scriptores Tres, Ricardus Corinensis, Gildas Badonicus, Nennius Banchorensis,' &c., 8vo.; but this work became scarce. In 1809 a translation was published in London.

RICHA'RDIA, the name of a genus of plants belonging to the natural order *Araceæ*, of which only one species is known, the *R. Æthiopica*. It was introduced into this country from the

Cape, under the name of *Calla Æthiopica*, in 1731. It is also found wild at St. Helena. It is one of the most beautiful of Aroideous plants. Its large spathe is pure white, surrounding a spadix which is coloured deeply yellow by its antheriferous flowers. *Richardia* is a hardy plant, bearing well our mildest winters, and growing in great vigour and beauty in the ordinary apartments of a house. It may be made to blossom all the year round.

RICHARDSON, JONATHAN, a portrait-painter, was born about 1665. He was articled to a scrivener, but eventually became a pupil of John Riley, and commenced the practice of portrait-painting, in which, even during the lives of Kneller and Dahl, he obtained much employment. He died May 28, 1745. Hudson, the preceptor of Sir Joshua Reynolds, was his pupil and son-in-law. As an artist, Richardson was one of the best painters of a head that this country had at that time produced, but there his merit ended. There are a few etchings of portraits by his hand, among which are his own, prefixed to his work on Criticism; John Milton; Alexander Pope; and Dr. Mead.

It is however as a writer on art that the fame of Richardson must depend. In 1719 he published two discourses, entitled 'An Essay on the whole Art of Criticism as it relates to Painting, and an Argument in behalf of the Science of a Connoisseur,' in one volume, octavo. These, with his 'Theory of Painting,' were published together by his son in 1773. Richardson produced several minor works.

RICHARDSON, SAMUEL, was born in Derbyshire in 1689, and was, in his seventeenth year, bound apprentice to Mr. John Wilde, a printer of London, after having had merely the education in reading and writing to be obtained at a common village school. He has informed us himself however, that long before this the peculiar talents which he afterwards displayed in his novels had begun to show themselves. His schoolfellows delighted in the stories which he would invent for their amusement; and the girls in the neighbourhood confided to him their secrets, and employed him to write their love-letters.

He was so punctual and industrious during the seven years of his apprenticeship, that Wilde used to call him the pillar of his house; yet he did not neglect his private studies, finding time by stealing it from the hours of rest and relaxation. He remained five or six years as foreman in Mr. Wilde's office after his apprenticeship expired, and then set up for himself in Salisbury Court, Fleet Street.

Richardson first became an author in the year 1740. Many years before, he had been greatly interested by a story of real life, the same in its general outline as that of 'Pamela;' he thought of making it the topic of a letter or two in a little volume of familiar letters which he had consented to write for some friends; but when he began to reflect on the subject, its capabilities gradually unfolded themselves to him, and the result was the first part of 'Pamela,' the two large volumes of which were written between Nov. 10, 1739, and Jan. 10, 1740. It was published in the latter year, and became so popular that five editions of it were called for within the twelvemonth. The first part was soon followed by the second, which however was a great falling off. Richardson also completed and published the 'Collection of Familiar Letters' out of the project of which his novel had arisen.

It was not till after an interval of several years that 'Pamela' was followed by 'The History of Clarissa Harlowe.' The first four volumes of this greatest beyond all dispute of Richardson's novels appeared in 1748, and immediately raised his reputation, both at home and abroad, to the highest point.

Richardson's next and last great work, his 'History of Sir Charles Grandison,' appeared in 1753. With all its faults this novel is full of its author's most graphic and dramatic genius.

His works, of which we have mentioned all those of importance, brought him a considerable harvest of profit as well as of fame; and his pen and a flourishing business together soon placed him not only in easy, but even, it may be said, in affluent circumstances. He died July 4, 1761, and was buried in the middle aisle of St. Bride's Church, London.

No character could be freer from vice of every sort, or more perfectly irreproachable, than that of Richardson. His principal weakness was a rather greater than usual share of literary vanity, not untinctured with some disposition to underrate other writers of the day. Richardson is considered the originator of the English novel, as distinguished from the romance; and the fact that Fielding followed in the same line would alone entitle him to a high reputation as a novelist. Richardson however never forgave Fielding for his 'Joseph Andrews,' which was intended as a burlesque on 'Pamela.'

RICHARDSON, WILLIAM, the son of a parish clergyman in Perthshire, was born in 1743. He was educated for the church in the university of Glasgow, and became tutor to the sons of Earl Cathcart. When the earl went as ambassador extraordinary to Russia, he accompanied the family to St. Petersburg, and acted as the earl's private secretary. In 1773 he was appointed Professor of Humanity in the university of Glasgow, and discharged the duties of this office till his death, which took place in 1814. Professor Richardson was a contributor to the 'Mirror,' and the 'Lounger,' and the author of two dramas, of 'Anecdotes of the Russian Empire,' and of a series of periodical essays called 'The Philanthrope.' He was best known however for a series of 'Essays on the principal Characters of Shakspere,' which appeared in three successive volumes beginning in 1775, and which were in 1797 collected into one volume.

RICHARDSO'NIA, the name of a genus of plants in the natural order *Cinchonaceæ*, given by Houston in honour of Richardson, an English botanist of the 16th century. This genus was called *Richardia* by Linnæus, but that name has been given to another plant. Most of the species

of Richardsonia are natives of South America. They possess emetic properties, and under the name White Ipecacuanha, &c., are used extensively as a substitute for the true Ipecacuanha.

RICHELIEU. [INDRE-ET-LOIRE.]

RICHELIEU, ARMAND JEAN DU PLESSIS, CARDINAL DE, a younger son of François de Plessis, Lord of Richelieu, was born at Paris, in 1585. He studied at the college of Navarre, and applied himself to divinity, in which he took a doctor's degree at the age of twenty. He succeeded his brother Alphonse as bishop of Luçon, and was consecrated in 1607. In 1614 he sat as deputy of the clergy of Poitou in the assembly of the States-General, on which occasion he harangued the young king, Louis XIII., and so pleased the queen-mother, Marie de' Medici, that she made him her almoner, which led to his being appointed secretary of state. When the king and his mother quarrelled, Richelieu acted as mediator, and acquired a permanent influence over both. In 1622 he was made a cardinal, and in 1624 the queen-mother obtained for him a seat in the council, when he became the chief minister of the crown, and continued to be so for the remainder of his life. Richelieu had three great objects in view: 1, to render the power of the crown absolute, and to humble the feudal nobility; 2, to annihilate the Calvinists as a political party; 3, to reduce the power of the house of Austria, and to extend that of France. Unscrupulous about the means, he succeeded in breaking down the political influence of the nobles, many of whom he sent to the scaffold on various pretences. His great political opponent was Gaston d'Orléans, the king's brother, who on the failure of a conspiracy against the cardinal, openly revolted against the king, but was at last obliged to seek an asylum in the Spanish Netherlands, and the Duke of Lorraine, who had assisted him, lost his dominions, which were seized by the French. The queen-mother, who had quarrelled with the cardinal, was obliged to quit France.

Richelieu accomplished his second object by besieging and taking La Rochelle, the stronghold of the Calvinists, in 1628. He however secured religious tolerance to the Calvinists by a royal edict in 1629. In furtherance of his third great object, Richelieu, setting aside all clerical scruples, supported the Protestants of Germany against the Emperor. His almoner, a Capuchin friar named Père Joseph, was his confident and trusty agent in all his diplomatic intrigues. At the same time Richelieu was assisting the Protestant Grisons against the Roman Catholic insurgents of Valtelina, who were supported by the Spaniards. He also allied himself with the States-General of the Netherlands to attack the Spanish dominions in Belgium, which he had in view to annex to France as far as Antwerp, a scheme in which however he failed. On the side of Spain the French took Roussillon, and supported the Catalonians in their revolt against Philip IV. Richelieu is also said to have meddled, by means of Père Joseph and the French ambassador in London, in the first stirring of the Covenanters and Puritans which led to the Revolution in England. In 1639 arms and ammunition were sent from France to Leith for the use of the disaffected. In Italy the French invaded Piedmont, which however they evacuated by a treaty with the princes of Savoy. The principal result of all these wars was to circumscribe the Imperial power in Germany, and to weaken the influence of Spain in the general politics of Europe.

In December, 1642, Richelieu died at his house at Paris. His funeral was magnificent, but the people of Paris made bonfires in token of rejoicing. He had become unpopular of late years on account of the burthens which he had laid upon them. Richelieu established the royal printing-presses; he was the founder of the French Academy; he built the Palais Royal, which was then called Palais Cardinal, and he rebuilt La Sorbonne. He was well informed for his age, and has left several works, some on religious and controversial subjects, and others on politics. The 'Mémoires du Cardinal de Richelieu,' written by himself, have been published in several volumes, in 1822–3, by Petitot, from a MS. corrected in the cardinal's own hand, which existed in the archives of the department of foreign affairs at Paris.

His grand-nephew, *Louis François du Plessis de Richelieu*, marshal of France, figured under Louis XV., and acquired a name for his bravery, ability, libertinism, court intrigue, and overbearing disposition. He died in 1788, at a very advanced age. A grandson of Marshal Richelieu entered the Russian service during the French revolution, was made governor of Odessa, a town which he greatly improved, and became, after the Restoration, minister of Louis XVIII. He was known by the title of *Duc de Richelieu*. He died in 1821.

RICHMOND. [SURREY; YORKSHIRE; VIRGINIA.]

RICHTER, JEAN PAUL FRIEDRICH, commonly called Jean Paul, was born March 21, 1763, at Wunsiedel, in the neighbourhood of Baireuth, where his father held the office of tertius or under-schoolmaster and organist. Shortly after the birth of his son, he was made pastor of the village of Jodiz, whence he was transferred to Schwarzenbach on the Saale, where Jean Paul studied Latin, Greek, and Hebrew. He continued his studies for two years at the gymnasium at Hof, and subsequently at the university of Leipzig. In the meantime his father had died, and his other relatives being poor, he was thrown entirely on his own resources. He had to contend with extreme want, and was sometimes even unable to obtain necessary food and clothing. Notwithstanding this painful situation, he persevered in his studies, and remained cheerful. Soon after his arrival at Leipzig he had given up the study of theology, which he had previously pursued, and seeing no other possibility of satisfying his wants, he wrote a book called 'Grönländische Processe,' 2 vols., Berlin, 1783. A second book, 'Auswahl aus des Teufels Papieren,' was also written, but no publisher could be found, as his first work had not met with a favourable reception. After many disappointments, he quitted Leipzig in 1785, and went to

Hof to reside with his mother. He engaged himself as a tutor in a family, and in 1788 succeeded in finding a publisher for his 'Auswahl aus des Teufels Papieren.' In 1793 several families of Schwarzenbach invited him to undertake the education of their children, an offer which he gladly accepted. Here he developed the principles of education which he afterwards (1807) published in his 'Levana.' His circumstances now began to improve, especially after 1793, when he found a publisher for a new work called 'Die Unsichtbaren Loge,' 2 vols., Berlin. This work attracted attention, and a fair prospect of success being opened to him, he left Schwarzenbach (1794) and returned to Hof, where in the course of a few years he wrote some of his most admired works: 'Hesperus,' 4 vols., Berlin, 1794; 'Quintus Fixlein,' Baireuth, 1796; 'Biographische Belustigungen unter der Gehirnschale einer Riesin,' Berlin, 1796; 'Blumen Frucht- und Dornen-Stücke,' &c., 4 vols., Berlin, 1796-97, and 'Der Jubelsenior,' ibid., 1797. In 1798, in which year his work called 'Das Campanerthal, oder die Unsterblichkeit der Seele,' was published at Erfurt, he was induced by Herder to take up his abode at Weimar. It was about this time that he become acquainted with the Duke of Saxe-Hildburghausen, who afterwards honoured him with the title of councillor of Legation (Legationsrath). In 1801 he married Charlotte Maier, the daughter of a physician of Berlin. He first settled at Meiningen, which in 1803 he exchanged for Coburg; but after a short stay in this town he took up his permanent residence at Baireuth. During this period of wandering he wrote 'Briefe und Bevorstehender Lebenslauf,' Gera, 1799; 'Titan,' 4 vols., Berlin, 1800-3; 'Die Flegeljahre,' 4 vols., Tübingen, 1804-5. While resíding at Baireuth, in 1809, the late prince primate, Carl von Dalberg, granted him a pension of 1000 florins per annum. In 1817 the university of Heidelberg gave him a diploma as doctor of philosophy, and in 1820 he was chosen a member of the Academy of Sciences of Munich. Among the works which belong to this last and happiest period of his life, we shall only mention 'Vorschule der Aesthetik,' 3 vols., Hamburg, 1804; 'Katzenbergers Badereise,' 2 vols., Heidelberg, 1809; 'Des Feldprediger Schmelzle Reise nach Flätz,' Tübingen, 1809; 'Der Komet, oder Nicolaus Markgraf,' 3 vols., Berlin, 1820-22.

During the last years of his life he was attacked by a complaint in the eyes, which at the beginning of 1825 terminated in complete blindness. His physical powers also began to decline, and he died Nov. 14, 1825.

His friend Dr Otto edited the works of Jean Paul in 60 small 8vo. volumes, Berlin, 1826-28. Another edition in 4 vols., imp. 8vo., appeared at Paris, 1836-38, which is disfigured by numerous typographical errors. The number of those who fully appreciate the merits of Jean Paul is, even in Germany, comparatively few. The best key to his writings is a work called 'Wahrheit aus Jean Pauls Leben,' in 8 vols., Breslau, 1826-33, which was commenced by Jean Paul himself, and after his death completed by Dr. Otto. Another very useful work in this respect is, R. O. Spazier, 'Jean Paul Friedrich Richter, ein biographischer Commentar zu seinen Werken,' 5 vols., Leipzig, 1833. 'Levana' and one or two of his other works have been recently translated into English.

RI'CINUS, the name of an apetalous genus of plants belonging to the natural order *Euphorbiaceæ*. The common name of *Ricinus* is *Palma Christi*, a name applied to these plants by older botanists, on account of the form of its elegant leaves. It was perhaps originally a native of Africa, but is now naturalised in Asia, America, and the south of Europe. *R. communis* will grow freely in this country, and when sown in pots or hotbeds early in the season, and transplanted in spring, it forms a very handsome border annual.

RI'CINUS COMMU'NIS, the Castor-Oil plant, was known from very ancient times both to the Egyptians and also to the Greeks. The native country of the *Ricinus communis* is unknown, though it is conjectured to be originally from Barbary. Like all plants which have been long in cultivation, numerous varieties of it are met with, differing not only in colour and the peculiar pruinose condition of the stem, but in stature and duration. In warm countries it is ligneous and perennial; in cold, annual and herbaceous. The entire plant is possessed of active properties, but the oil extracted from the seeds is only employed in Europe. The ancients administered the seeds entire, but their variable action, occasionally even producing fatal effects, led to their disuse, and the oil is of comparatively recent introduction. The seeds, of which three are found in each capsule, are about the size of a small bean. They were formerly known in the shops as *Semina Ricini*. Various procedures have been adopted to extract the oil, and these have much influence on its qualities in respect of colour, acridity, and freedom from rancidity. Both in India and America, whence the first supplies were brought, much heat was employed, and during the process a volatile principle was either liberated or produced, which was so irritating as to require the workmen to protect their faces by masks. Even in the present day some heat is used to obtain what is termed the *cold drawn* castor-oil, but it is quite unnecessary, and should always be avoided.

Castor-Oil of good quality is a thickish fluid, of a very pale yellow colour, almost limpid, with a slightly nauseous odour, and an oily taste, mild at first, but causing a feeling in the back of the throat which is more or less intense in proportion to the freshness of the specimen. Old or badly-prepared oil is rancid and disagreeable.

It can be solidified only by a very low temperature. It is distinguished among fixed oils by its complete or nearly complete solubility in pure sulphuric æther and in alcohol, thereby approaching the essential oils in its habitudes; and its easy combination with alkaline leys, and consequently its ready saponification, two properties of much importance, the one furnishing a convenient test of its purity, the other facilitating its administration in a form less repulsive than its ordinary state.

Castor-Oil is a mild aperient or laxative when pure, operating without griping or other incon-

venience, and commonly very soon after its administration. It is the most proper laxative for infants, and in many inflammatory states of the abdomen, or of the kidneys, bladder, &c. It is also one of the best purgatives in rheumatism, especially in lumbago, and one of the best means of relieving habitual constipation, as, unlike other purgatives, the dose may be successively reduced without its power being impaired. It is also a most eligible medicine in piles or other affections of the rectum. Alone or with turpentine it is a very efficacious means of expelling worms. The chief obstacle to its extensive use is the repulsive taste which it often possesses. Many expedients have been adopted to remove or lessen this; but no artifice can make bad or old oil good or palatable. It is usually floated on peppermint-water, or on distilled water, with syrup of lemon or orange, to disguise the nauseous taste. By far the best plan however is to take advantage of the tendency to combine with alkalis, and so form a soapy emulsion, which does not destroy the purgative power, while it completely alters the appearance, and prevents any one recognising the oily object of his aversion. To effect this however requires care and skill, especially as a variable quantity of alkaline ley is needed, according to the age of the oil, very old oil requiring more ley than fresh oil. In general from fifteen to twenty drops of pure Liquor Potassæ will saponify half an ounce of oil, to which one ounce of distilled water and one drachm of spirit of pimento or of nutmeg are to be added.

RICKETS, or *Rachitis* (from ῥάχις, the spine), is a disease in which the bones being of unnatural softness, some of them bend under the weight of the superincumbent parts of the body. Bones affected with rickets present such a softness of texture that they may be cut with a knife; their walls are remarkably thin, and their interior, instead of being filled with marrow deposited in their bony cells, is occupied by a semi-fluid jelly-like substance of a reddish colour, which fills a number of rounded cavities of irregular size. The quantity of earthy matter in such bones is reduced to considerably less than its natural proportion, and they lose much of their normal weight. All the bones may be thus affected, but it is only those which have to bear the weight of the body that give evidence of it by bending; the arms, for example, never change their form, but the thighs and legs become arched forwards under the weight of the trunk; the spine assumes a variety of curves from the pressure of the head; the breast-bone becomes prominent and the ribs flattened; the haunch-bones grow outwards, and the pelvis is sometimes seriously deformed by an approximation of its anterior and posterior boundaries.

This disease occurs in those who are predisposed to scrofulous disease, and young persons are exclusively subject to it. Rickets come on at the age of two or three years, and from that time to puberty, and as the curvatures begin to form as soon as the weight of the body is thrown on the limbs by assuming the erect posture, it is commonly proposed to support the upper part of the body and the limbs by *irons*. Such measures however are, in a large majority of cases, full of mischief; if they can ever accomplish their intention of supporting the head and trunk, it can only be by preventing entirely that active use of the limbs which is essential to the attainment of the proper hardness of the bones. It is constantly observed that the strength and density of bones are in direct proportion to the habitual exertion of the muscles attached to them; and as the latter are made inactive by irons, the application of such modes of restraint cannot but be, in most cases, injurious to those affected with rickets.

The best treatment consists in giving tonic medicines and a nutritious diet. Cod-liver oil has been found very beneficial in this form of disease.

RICKMAN, THOMAS, was born at Maidenhead, June 8, 1776, and brought up by his father, who was a surgeon and apothecary in that town, to the same profession. He went to London in 1797, and obtained some employment as a chemist's assistant; but he abandoned the calling, and held situations subsequently, both in London and the country, with a grocer, a cornfactor, and an insurance broker. What led him to the study of architecture is unknown, but he contrived, unaided by any person, to gain considerable knowledge of the art.

On the grant of a million for additional churches being made by parliament, Rickman became a competitor, and a design sent in by him being accepted, he determined to establish himself as an architect. He quitted Liverpool, where he had for some time resided, and removed to Birmingham, as being in his opinion a likelier situation for obtaining practice from various quarters. Having no practical experience at that time himself, he engaged Mr. Henry Hutchinson as his managing assistant in all matters of business, and after his death (1830) entered into partnership with Mr. Hussey. He continued to exercise his profession up to the time of his death, March 4, 1841.

Had Rickman been known only as a writer, his 'Attempt to discriminate the Styles of Architecture in England' would have obtained for him celebrity, for it has become a standard book, and one almost indispensable to the student. Among his works in the practical branch of his profession, we may mention that he restored Rose Castle, the palace of the Bishop of Carlisle. At Cambridge he erected the new court and buildings (begun in 1827) of St. John's College. Perhaps hardly any individual in the profession was ever employed upon so many churches as Rickman, and a list of them and of other buildings by him is given in the fourth edition of his book; but, long as it is, that list is incomplete, because it does not come down later than 1835. Mr. Rickman was married three times. He was brought up as a member of the Society of Friends; but withdrew from that body.

RICKMANSWORTH. [HERTFORDSHIRE.]

RICOCHET, a word expressing the act of rebounding, is applied to that mode of firing ordnance in which the shot or shell, having described a curve in the air, descends to the

ground, and, after striking, rebounds from thence; several descents and subsequent rebounds frequently take place before the force of impulse is destroyed.

Ricochet firing is most generally employed in the attack of fortresses, in order to enfilade or rake the faces of works whose fire might be directed upon the ground on which the approaches are to be made. The same mode of firing is also occasionally employed by the besieged against the batteries of the enemy. In either case the intention is to dismount the artillery by causing the shot or shells to strike it obliquely behind the parapet or epaulement. It is also used to compel the troops to abandon the parapets, or to destroy the palisades of the covered-way or ditches, so as to facilitate the entrance into a work when an assault is to be made by main force.

The practice of firing à-ricochet was first tried by Vauban at the sieges of Philipsburg and Mannheim, in the war of 1688; and, on these occasions as well as at the siege of Ath, which was conducted by Vauban during the same war, the surrender of the places was greatly accelerated by it. Against the effects of this kind of fire on open parapets, no other remedy can be found than in the construction of traverses or blindages on the terrepleins; and the inadequacy of such means to the preservation of the artillery in fortresses has led, in recent times, to the very general practice of placing it in strong shell-proof casemates.

It appears from the experiments made at Woolwich in 1821, that the best elevations of ordnance for enfilading a work à-ricochet with shot or shells, is that in which the axis of the piece is directed at an angle varying from 6 to 9 degrees above a line drawn from the chamber of the gun or howitzer to the crest of the parapet over which the projectile is to pass.

Ricochet firing, when first employed in sieges, from the defenders not being prepared with means to diminish its destructive effects, produced immediately a strong impression of its power; and the opinion of its superiority to the direct mode of firing has continued to prevail from the time of Vauban to the present day, though the service of artillery is now so precise, that when the guns in an enemy's work can be seen, they can be as readily dismounted by the latter mode as by the ricochet. It ought also to be remembered that before the latter can be usefully employed, the parapets, traverses, or blindages, which cover the artillery of a fortress must be ruined by other means; and it may reasonably be concluded that the rapid reduction, or the most protracted defence of a place, will always be owing to a judicious combination of the different modes in which, according to the circumstances, artillery can be used during the siege.

RIDEAU CANAL. [CANADA.]

RIDING. [YORKSHIRE.]

RIDINGER, JOHANN ELIAS, was born in 1695, at Ulm in Suabia, and was instructed in drawing by his father, and in the rudiments of painting by Christoph Rasch. His genius led him to animal painting, in which he is generally admitted to be unrivalled. His landscapes are always suited to the animals. He was less happy in the representation of the human figure. His paintings are rare, his time being almost wholly taken up by his numerous drawings. The largest and most choice collection of them (about 1400) are or were in the possession of Mr. Weigel at Leipzig. His copper-plates or etchings are very numerous. He died at Augsburg in 1767.

RIDLEY, NICHOLAS, was born in Northumberland, near the beginning of the 16th century. He was educated at Newcastle, and at Pembroke College, Cambridge. He received further instruction in France, returned to Cambridge, took orders, and became master of his college. He became one of the king's chaplains, and in 1547 was nominated bishop of Rochester. His denunciations of the use of images and of holy water soon showed him the strenuous supporter of Protestant doctines, and his abilities caused him to be associated with the principal reformers both in their chief undertakings and discussions. Some time after Bonner was deprived of his dignities, Ridley was appointed his successor in the see of London. In his diocese he actively endeavoured to diffuse Protestant doctrines, for the better understanding of which he assisted Cranmer in framing forty-one articles, which were subsequently promulgated. He was nominated bishop of Durham, but his appointment was never completed. He exercised great influence over Edward VI., and induced him to found St. Bartholomew's Hospital, and other important charities.

On Mary's accession Ridley was imprisoned, notwithstanding that he had previously interceded with King Edward to allow her the free exercise of her religion. Her detestation of his opinions was aggravated both by the services he had rendered to the Protestant cause and his opposition to her accession. In April, 1554, a convocation was appointed at Oxford, at which the doctrine of the real presence was to be discussed, and Cranmer, Ridley, and Latimer, were sent there as prisoners. Each disputed in his turn amidst great disorder, shoutings, tauntings, and reproaches. All were considered to be defeated, and all were adjudged obstinate heretics. Ridley never again left Oxford. After resisting many efforts to induce him to recant, he was led with Latimer to the stake on Oct. 16, 1555. The place of his execution was in front of Baliol College. Burnet says that for his piety, learning, and solid judgment, he was the ablest man of all that advanced the Reformation.

RIES, FERDINAND, was born at Bonn on the Rhine, in 1785. He received instructions in music from Bernard Romberg, and finally had a few lessons in composition from Albrechtsberger, the celebrated theorist. His first professional attempts were made at Munich; his next at Vienna, where he remained till 1805, when he was drawn as a conscript for the French army, but, having lost the use of one eye, he was declared disqualified for military service. He afterwards went to Paris, and composed much, but not successfully. The Beethoven school, to which he belonged, was then but little understood out of

Germany. He afterwards proceeded, through Hamburg, Copenhagen, and Stockholm, to St. Petersburg, where fortune began to smile on his efforts, and he was preparing to set out for Moscow, but the French army again deranged all his plans, and he finally determined to seek the English shores. He arrived in London in 1813, and was admitted into the Philharmonic Society, where his symphonies were performed with great applause, and he exhibited his talents as a first-rate pianoforte player. In 1824, having amassed a handsome independence, he returned to his native country, where, besides many works for the pianoforte, he produced two German operas, and an oratorio, 'David.' He died at Frankfort in 1838.

RIETI. [Spoleto-e-Rieti.]

RIETI, the ancient *Reáte*, once one of the principal towns of the Sabini, and now one of the chief towns of the province of Spoleto-e-Rieti, in the Papal State, stands on an elevated plain among the western highlands of the Apennines, between two ridges of which lies the basin of the Velino, forming in its lower part the beautiful plain of Rieti. This plain terminates in the magnificent falls of Terni, whereby the Velino leaps into the Nar by a series of beautiful cascades down a total perpendicular height of about 1000 feet. Reate was an early and constant ally of Rome. Remains of the Roman baths are still seen in the territory of Rieti. In more modern times the people of Rieti were among the first to pay voluntary allegiance to the see of Rome, as their temporal sovereign, in the time of Pope Adrian I. The city was often an asylum for the popes in the middle ages, when driven away from Rome by faction or foreign invasion. In 1831, the people of Rieti showed their devotedness to the papal see by repulsing the insurgents from Bologna and the Romagna, who were advancing towards Rome. Rieti is built partly on the slope and partly at the foot of a hill; it gives title to a bishop, has a college, a clerical seminary, and also manufactures of coarse woollens, silks, glass, and leather. The population amounts to about 9000, among whom are many wealthy landed proprietors. The town-house is a massive building, in the highest part of the town, and enjoys a splendid view of the surrounding country. The cathedral was built in the 12th century, but has been repeatedly restored. There are several other churches and convents, and an episcopal palace, which are worthy of notice.

RIFLE, or RIFLED, a term applied to muskets or pieces of ordnance when their bores are furrowed with spiral grooves. It is probably derived from an Anglo-Saxon word signifying to *rive* or *tear;* the grooves or channels being formed by a machine which scrapes away the substance of the barrel interiorly in parallel and serpentine directions.

Rifled muskets, or carbines, appear to have been in use on the continent about the middle of the 17th century; but such arms were not introduced in the British service till the time of the American Revolutionary war.

A bullet made of lead cast in a spherical form, according to the practice till lately followed, having unavoidably some irregularities on its surface, and frequently, from unequal expansion, a cavity in the interior; it follows that, when such bullet is discharged from a common musket, it deviates continually from the direction which it should take by gravity and the impulse of the fired gunpowder. The intention therefore in forming spiral grooves within the barrel of a musket or piece of ordnance, is, to produce a rotatory motion of the shot about an axis which shall coincide with the line of its path, in order that the unequal pressure of the atmosphere in its front, on account of any irregularity in its form or density, may correct itself at every half-revolution of the shot on such axis. The number of spiral channels in a rifle-musket is, in general, two; and one revolution of the spiral, in the whole length of the barrel (=30 inches) is considered sufficient.

The most general practice of late has been to press the bullets (by means of the ramrod) into the barrel upon a piece of greased cloth or leather (called the *plaster*). But, at present, rifle-bullets are made with a projecting zone which surrounds them on the circumference of what may be called a great circle. The pieces are loaded at the muzzle, and the parts of the zone which are diametrically opposite to one another are those which pass along the two grooves in the barrel.

Hollow spheroidal bullets, charged with powder and furnished with percussion caps, have in this country, been proposed by Captain Norton for the purpose, on being fired from rifled muskets, of causing the explosion of an enemy's tumbrils or of any box containing powder; and the French have occasionally used, with carbines, a species of cylindro-conoidal shot surrounded with many circular grooves, which were supposed to cause the axis of the shot to keep nearly in the direction of its path.

In the year 1774 Captain Blair proposed the formation of rifled guns of iron to be used as field artillery. The balls were to be of lead with knobs on them to fit the grooves, and they were to weigh not more than two pounds. In 1846 experiments were made at Aker in Sweden, with iron-rifled guns discharging hollow cylindro-conoidal shot, weighing 69lbs. These guns are loaded at the breeching; and, when charged with 9lbs. of powder, the ranges are said to have been as great as those of a 68-pounder shot with 20lbs. of powder from British guns.

It may be mentioned here, that bullets for common muskets, as well as for rifle-barrels, are not now cast in their actual forms, but are made from lead which has been previously cast in cylindrical rods. The bullets are then formed by compressing the rods between two revolving cylinders. The pressure, by forcing the particles together, fills up any vacuities which may form themselves in the rods during the cooling process, and probably renders the density of the ball nearly uniform.

RIFLEMEN (called by the French *Tirailleurs*) are soldiers whose duties correspond nearly to those of light-infantry troops, but their muskets being rifled or grooved, the effect of their fire, within certain limits, is more certain. [Rifle.]

RIGA, the capital of the Russian government of Livonia, is situated in 56° 57′ N. lat. 24° 6′ E. long., on the right bank of the Düna about 7 miles above its entrance into the gulf of Riga, and has 71,000 inhabitants. The width of the river and the distance of the town from the sea make the port very spacious and secure, and the merchantmen come up to the quays. In summer a bridge of pontoons, 40 feet wide and 2600 feet long, loosely attached to piles, and rising and falling with the tide, is laid across the river. The town is surrounded with ramparts and bastions. It has a strong citadel, and is otherwise well fortified, so that it is considered one of the most important bulwarks of the Russian Empire. It consists of the town itself, of one suburb within the palisades, and of two more distant suburbs on the left bank of Düna. There are three gates towards the country and four towards the Düna. The houses are of stone, many of them large and handsome, but the streets are narrow and crooked. There is one inconsiderable market place, a pretty spacious parade before the palace, a Lutheran cathedral, and a great number of other churches. The other public buildings are—an imperial palace, with an observatory; the residence of the civil governor; an ancient palace, partly used as the residence of the military governor, partly serving for barracks; the town-house, containing the exchange; the assembly-house of the estates of Livonia; the arsenal, the hospital of St.-George, the Catherinenhof, a bomb-proof warehouse 445 feet in length, and a theatre. There are numerous literary and useful institutions in the town.

The town of Riga was founded about the year 1200, by Albert, the third bishop of Livonia, who established a German colony there. The city grew in importance, and in the 13th century joined the Hanseatic league. At the beginning of the 16th century it belonged to the Teutonic knights, and afterwards was forced to submit to Poland. In 1621 it was besieged and taken by Gustavus Adolphus. In 1710, after a vigorous defence and a fearful slaughter, it was taken by Peter the Great, and annexed to the Russian Empire. In the siege of 1812, the suburbs and a considerable part of the town itself were destroyed by the French. The suburbs have been rebuilt, and are much handsomer than before. It has likewise suffered several times by fires and inundations.

Riga is a very important commercial town; the numerous ships in the river, the bustle in the streets, and the well-stocked warehouses and shops, are indications of the extensive trade of which Riga is the centre; it is in fact, next to St. Petersburg, the greatest emporium of foreign commerce in the empire. The exports consist of the great staple articles of Russian produce, corn, timber, flax, hemp, linseed, tallow, Russian leather, and sail-cloth. The total value of the exports in 1849 was 2,730,000*l.* against 2,120,000*l.* in 1848. In these were included 44,700 tons of flax; 15,250 tons of hemp; 81,733 barrels of sowing, and 255,000 quarters of crushing, linseed; 11,500 quarters of hempseed; 274,260 quarters of corn, chiefly barley, oats, and rye; 35 tons of quills; 410 cargoes of timber and staves; and 1700 tons of hempen and flaxen tow. In the same year, 1849, 1729 vessels arrived, and 1677 left the harbour.

The value of the imports, consisting of colonial produce, woollens, calicos, silks, wine, &c., is not above one-third of the value of the exports; about two-thirds of the ships that enter the port arrive in ballast. Riga has now considerable manufactories of woollens, cotton goods, tobacco, starch, looking-glasses, and iron wares; it has also sugar-refining houses.

(*Annual Circular for* 1849 *of the Messrs. Brandt of Riga; Russian Official Journals.*)

RIGAUD, HYACINTHE, was born at Perpignan, July 25, 1659. He was the son of Matthias Rigaud, an artist, from whom he learned the rudiments of painting, and upon whose death he was sent to Montpellier, and placed under various masters. In 1681 he went to Paris, and in the following year gained the chief prize given by the Academy. In 1700 he was admitted a member of the Academy of Paris, and presented as his admission picture a portrait of the sculptor Desjardins, which gained him a high reputation. He painted several portraits of Louis XIV., those of the royal family, the principal nobility of the court, and many of the most illustrious personages of Europe. In 1727 he was pensioned and decorated with the order of St. Michael. He was successively professor, rector, and director of the Academy. He died Dec. 19, 1743. Works by Rigaud are contained in most of the collections of Europe. In the Louvre, besides others, are the portraits of Le Brun, Mignard, and Bossuet. His pictures have been engraved by Edelinck, the Drevets, J. Audran, and other eminent artists, and consist of two hundred historical portraits.

RIGHI'NI, VINCENZO, a composer, was born at Bologna about 1758, and received his musical education under Padre Martini, but completed it at Prague, where he acquired a vigour which was not then the attribute of the Italian School. Rigini composed many operas for different theatres, among which his 'Armida,' 'Tigrane,' 'Enea nel Lazio,' and 'Alcido al Bivio' are well worth the notice of the true amateur. He died in his native city, in 1812.

RIGHT. The word *right* occurs under some form in all the Teutonic languages; and it bears a double meaning equivalent to the significations of the Latin word *jus*, namely *law* and *faculty*. The Anglo-Saxon word bore this double meaning, but *right* in modern English, has lost the signification of *law*, and has retained only its other meaning.

Right, in its strict sense, means a legal faculty or power which can be enforced by legal remedies, or the invasion of which can be punished by a legal sanction. Every right therefore presupposes the existence of positive law.

The modes of acquiring rights are various, and can only be explained in a system of jurisprudence; for example, a person may acquire a right by contract, by gift, by succession, by the fulfilment or non-fulfilment of a condition.

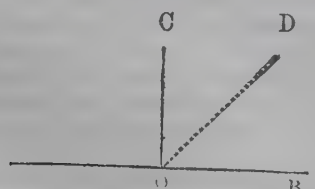
Every right correlates with a legal duty, either in a determinate person or persons or in the world at large. Thus a right arising from a contract is a right against a determinate person or persons; a right of property (or dominion) in a field or house, is a right to deal with the field or house, availing against the world at large. On the other hand, every legal duty does not correlate with a right; for there are certain absolute duties which do not correlate with a right in any determinate person. Such are the duties which are included in the idea of police; as the duties of cleanliness, order, quiet, at certain times and places.

The word right is sometimes used, improperly, to signify not legal but moral claims; that is to say, claims which are enforced merely by public opinion, and not by the legal sanction.

Some writers speak of natural rights, which are supposed to be anterior to civil government, and to be paramount to it. Hence these supposed natural rights sometimes receive all the additional epithets of indefeasible, indestructible, inalienable, and the like. This theory of natural rights is closely connected with the fiction of a social compact made between persons living in a so-called state of nature; a theory which has now been abandoned by all just thinkers.

RIGHT. (Mathematics.) This term is applied in mathematical language to anything which is imagined to be the most simple of its kind, to distinguish it from others. Thus a right line is a straight line; a right angle is the most simple and well known of the angles used by Euclid; a right cone is one in which the axis is at right angles to the base; and so on.

RIGHT ANGLE. When two lines, at first coincident, are made to separate so that one of them revolves about their common extremity, the revolving line will in time become the continuation of the other. This angle or opening, made by a line and its continuation, would, we might suppose, be one of the principal angles considered in geometry, and should, according to the previously-defined meaning of RIGHT, be called a right angle. But in the geometry of Euclid the word angle seems to have been essentially connected with the idea of a pointed corner, and we have no means of finding out that he considered a line and its continuation as making any angle at all. Instead of this angle, made by AO and OB, or the angle



of opposite directions, he introduces its half, and calls it a right angle. Let AOC and COB be equal angles, that is, let OC bisect the angle AOB, and each half is called a right angle. When the angle AOB is mentioned, it is as two right angles.

RIGHT ASCENSION. [ASCENSION.]

RIGHT, PETITION OF. [PETITION OF RIGHT.]

RIGHTS, BILL OF. [BILL OF RIGHTS.]

RIGIDITY OF ROPES. When a stiff rope is bent over the upper part of a wheel or pulley, in a vertical plane for example, the weights or powers applied at its extremities are not always sufficient to draw the descending portions into the positions of two vertical lines; and the experiments of Coulomb have shown, that, with ropes consisting of 30 threads and 2½ inches in circumference, the weights requisite to overcome the rigidity, when the ropes passed over a pulley 4 inches diameter, and were strained by weights equal to 25 lbs., 125 lbs., and 425 lbs., were 5 lbs., 8½ lbs., and 23 lbs. respectively.

Unfortunately ropes of equal dimensions differ much in rigidity, so that little dependence can be placed on the results of general formulæ in estimating its value. White ropes when wet are more stiff than those which are dry, and the rigidity of ropes is greatly increased by tarring them. In general the weights necessary to overcome the resistance of tarred ropes is proportional to the number of the threads of which they are composed.

RILEY, JOHN, born in London, 1646, was perhaps the first Englishman that attained any excellence in portrait painting. He was instructed in his art by Fuller and Zoust, but he adopted Vandyck as his model. He painted, however, much in the style of Lely; his draperies were admirable. Upon the death of Sir Peter Lely, Riley came into general notice. He painted the portraits of Charles II., James II., and his queen, Mary of Modena, and also of William and Mary, to whom he was appointed state painter.

Riley's most celebrated portraits are those of the lord-keeper North, Bishop Burnet, and Dr. Busby, master of Westminster School. Riley died in London, 1691.

RIMINI. [FORLI.]

RINCON, ANTONIO DEL, court painter to Ferdinand and Isabella, was born in Guadalaxara, probably about 1446. He is supposed to have studied at Florence. Most of Rincon's works have already perished, but there is an altar-piece, consisting of seventeen pictures from the life of the Virgin by him in the church of Robledo de Chavela, on the road from Madrid to Avila, near the Escurial, which display many excellent qualities of art. Rincon was decorated with the order of Santiago. He died at Seville in 1500.

Antonio's son, *Fernando del Rincon*, was a good fresco painter.

RING BLACKBIRD, or RING-OUZEL. [BLACKBIRDS.]

RING-DOVE, one of the English names of the Wood Pigeon, or Cushat, *Columba Palumbus*, Linn.; *Ramier* of the French; *Colombaccio, Palombo, Piccione da Ghianda* of the Italians; *Ringeltaube* of the Germans. The term Ring-Dove is also applied to the Collared Turtle, *Columba risoria*, Linn.; *Tourterelle à Collier* of the French; *Lachtaube* of the Germans. [COLUMBIDÆ.]

RINGENT, a form of the corolla of plants, so named from the supposed resemblance to the snout and mouth of some animal. The petals are

irregular and gaping. The natural order *Lamiaceæ* possess this form of corolla.

RINGS, COLOURED, the coloured bands which are familiarly seen in soap-bubbles of sufficient tenuity, in thin plates of mica, and generally in any transparent plate of small width, whether bounded by denser or rarer media. If a convex lens of glass about 10 feet focus, be pressed down upon the plane surface of a glass plate, and white light be incident upon it, the different reflexions of the light between the lens and plate give rise to the system of coloured bands. If these be viewed by reflexion, the point of contact appears to be black, from the light there being almost wholly transmitted, while each band consists of a gradation of colours from its interior to its exterior border, in the following order :—

First.	Second.	Third.	Fourth.
Black	Violet	Purple	Dull Green
Faint Blue	Blue	Blue	Pale Pink
White	Green	Green	Red
Yellow	Yellow	Yellow	
Orange	Crimson	Pink	
Red		Crimson.	

In the fifth, sixth, and seventh, the colours are green and pink, with a middle white in the fifth, but they are now faint colours, and gradually become invisible.

Newton found the intervals between the plates in the succession of the darkest parts of the several rings to be as the numbers 0, 2, 4, 6, &c., and those corresponding to the brightest parts, as the odd numbers 1, 3, 5, &c., the interval corresponding to the brightest part of the first ring being only 178,000th part of an inch. If homogeneous light of any colour be used, the rings of light then produced are all of that colour, intercepted by bands absolutely black.

If we place the glasses between the eye and the source of light, so that the rings may be viewed by that portion of it which is transmitted, we find, as might be expected, that the colours are now complementary to those visible by reflected light. [Colours of Plates.]

RINGS, FAIRY, is a name given to certain spots which are observed amongst grass in fields, and which are characterised by being more luxuriant than the surrounding herbage. They are of two kinds : either an entire knot of grass is more luxuriant than the rest, or the luxuriant grass grows in a circle or the segment of a circle around a comparatively barren spot. The name of fairy rings was originally given to these spots because they were supposed to be the places where the fairies held their nightly revels. Recently a better cause has been assigned for their origin. They are now known to be those portions of the surface on which a species of fungus has grown, which by dying has afforded nutriment for the grass on the spot.

RINGTAILED EAGLE, a Golden Eagle in its youthful plumage. [Falconidæ, vi., 76.]

RINGWOOD. [Hampshire.]

RINGWORM. [Porrigo.]

RIO DE JANEIRO. [Janeiro.]

RIO DEL NORTE. [Mexico.]

RIO GRANDE. [Mexico.]

RIO GRANDE DO NORTE. [Brazil.]

RIOJA. [Castilla-la-Vieja; Plata, La.]

RIOM. [Puy-de-Dôme.]

RIOT. A riot is a misdemeanour at common law. It is defined to be 'a tumultuous disturbance of the peace by three persons or more, assembling together of their own authority, with an intent mutually to assist one another against any one who shall oppose them in the execution of some enterprise of a private nature, and afterwards executing the same in a violent and turbulent manner, to the terror of the people, whether the act intended were of itself lawful or unlawful.' But if the enterprise is for the purpose of redressing grievances generally throughout the kingdom, or, if it has any other general character of violence, the offence is not a riot, but high treason.

Violence, if not of actual force, yet in gesture or language, and of such a nature as to cause terror, is a necessary ingredient in the offence of riot. The lawfulness of the enterprise operates no further than as justifying a mitigation of the punishment. All persons present at a riot who instigate or encourage the rioters, are themselves also to be considered as principal rioters.

The most important act of Parliament about riots is 1 Geo. I., st. ii., c. 5, commonly called the Riot Act. By that statute it is provided that 'if any persons to the number of twelve or more, being unlawfully, riotously, and tumultuously assembled together to the disturbance of the public peace, shall continue so assembled for the space of an hour after a magistrate has commanded them by proclamation to disperse, they shall be considered felons.'

By the 7 & 8 Geo. IV., c. 30, s. 8, rioters who demolish or begin to demolish a church or a chapel, a dwelling-house, or any other of the various buildings or machinery mentioned in that Act, are to be considered as felons. By 7 & 8 Geo. IV., c. 31, provision is made for remedies against the hundred in case of damage done by rioters.

With respect to unlawful assemblies of a seditious character, various provisions are enacted by 39 Geo. III., c. 79, and 57 Geo. III., c. 19 ; and in reference to those for training to the use of arms, by 60 Geo. III., c. 1.

RIPOLL. [Cataluña.]

RIPON. [Yorkshire.]

RIPPERDA, JOHN WILLIAM, Baron, afterwards DUKE OF, a descendant from an ancient Spanish family, settled at Groningen, then subject to Spain, was born in the latter part of the 17th century. He was educated in the Jesuits' college at Cologne. After greatly distinguishing himself in the course of his education, Ripperda entered the army of the United Provinces, served during the war of the Succession, and rose to the rank of colonel. He then married an heiress, but in order to obtain her property he had to renounce his religion. In 1715 the States General, of which assembly he had become a member, appointed him envoy extraordinary to the court of Spain. During his residence at Madrid, Ripperda carried on several intrigues by no means

creditable to his character either as an ambassador or a man. By a course of duplicity towards other powers, and playing into the hands of Spain, he rose high in favour both with Philip and his minister, Alberoni; and as a crowning step, he, in 1718, resigned his appointment under the Dutch government, and renounced his adopted religion as a necessary preliminary to his advancement in Spain. The fall of Alberoni, which was hastened by Ripperda, opened to this ambitious man the way to power, and he was entrusted, in 1725, with the formation of a secret treaty with the Emperor. To reward his services in that memorable transaction, he was soon after created a duke, and raised to the dignity of grandee of Spain.

On his return to Madrid, Ripperda was appointed secretary of state, and was next raised to the post of prime minister. His administration however was not of long duration. Unable to fulfil the secret engagements entered into with the house of Austria, or to accomplish the vast schemes laid down by the treaty of Vienna, Ripperda fell into disgrace. On May 25, 1727, he was arrested at the house of Colonel Stanhope, where he had taken refuge, and was imprisoned in the fortress of Segovia, until he made his escape, and arrived at length at Cork. After spending some time in England, he set sail for his native country in 1731, and settled at the Hague. Whilst there he became acquainted with an envoy from the court of Marocco, named Perez, who perceiving the violent hatred which Ripperda bore to the Spaniards, induced him to try his fortunes upon the shores of Africa. Ripperda accordingly went to Tangier, and was well received by the Emperor of Marocco (Muley Abdallah), who gave him the command of an army destined to repel an invasion from Spain. Ripperda was however defeated before Oran, which city fell into the hands of the Spaniards in 1732.

About this time Ripperda is said to have abandoned the Roman Catholic creed, and to have embraced the Mohammedan religion, taking the name of Othmán Pashá. He died at Tetouan, in 1737. After his death there appeared at Amsterdam an account of his life, under this title: 'La Vie du Duc de Ripperda, par M. P. M. B.,' 8vo., Amst., 1739. The same work was translated into English, by John Campbell, and published as 'Memoirs of the Basha Duke of Ripperda,' London, 1739, 8vo.

RISK. In the theory of Probabilities, the risk of loss or gain means such a fraction of the sum to be lost or gained as expresses the chance of losing or gaining it: thus an even chance of losing 40*l.* is considered as a positive loss of one-half of 40*l.*, or 20*l.*; and 2 to 1 for gaining 60*l.* is counted as two-thirds of 60*l.*, or 40*l.* If both these risks were encountered at the same time, the whole transaction would be considered as a gain of 40*l.*—20*l.*, or 20*l.*, since this is the sum which would be netted by every such transaction in the long run, and one with another.

RI'SSOA, M. de Freminville's name for a genus of small testaceous trachelipods (gastropods of Cuvier), founded on some small shells observed by M. Risso of Nice, and described by M. Desmarest in 1814 in the 'Nouveau Bulletin de la Societé Philomathique.'

Generic Character.—*Animal* with a subtriangular foot, truncated anteriorly, pointed posteriorly. Head proboscidiform, with a subulate tentacle on each side, at the external base of which the eye is placed on a little convexity; mouth prolonged into a short and truncated proboscis. *Shell* elongated, turriculate, sometimes short and subglobular; aperture oval, semilunar, subcanaliculate, having the right lip thickened, and nearly always projecting forwards, and arched longitudinally; operculum horny, closing the aperture exactly.

Localities.—The Mediterranean Sea principally, but species are recorded from the coasts of Great Britain and France, and from the East Indian seas and Senegal.

Examples, *Rissoa acuta*, *R. costata*, *R. hyalina*, and *R. cancellata*.

RITSON, JOSEPH, was born at Stockton in Durham. He was by profession a conveyancer, but being appointed deputy high bailiff of the duchy of Lancaster, he did little in his profession, living on his income, and spending his time in literary pursuits. During the twenty years between 1782 and 1802, he published various works in quick succession. The first which brought him into notice, was his 'Observations on the three first volumes of the History of English Poetry,' in a familiar letter to the author (Warton), 4to., 1782. The work has become a bye-word when men would speak of critical abuse; but its strictures are in the main just. In the next year he published some 'Remarks on the Commentators on Shakspere,' which is to be distinguished from a larger work published by him in 1792, entitled 'Cursory Criticisms on the Edition of Shakspere published by Edmund Malone.' In 1790 appeared his volume of 'Ancient Songs, from the time of King Henry III. to the Revolution,' reprinted in 1829. This is regarded as one of the most valuable of his works. He produced various works of the same class, the enumeration of which would alone occupy a large space. In 1802 appeared his 'Bibliographia Poetica,' a catalogue of English poets, with a short account of their writings, a work very imperfect, but to which succeeding writers in this department have been greatly indebted. In the same year he published 'An Essay on Abstinence from Animal Food as a Moral Duty.' He died Sept., 1803. Some account of his life was published by Mr. Hazlewood in 1824.

RITTENHOUSE, DAVID, was born April 8, 1732, near Germantown, in Pennsylvania, and, before he was seventeen years of age, he displayed a taste for mechanical and mathematical subjects. His success appears to have been extraordinarily great considering his means, for his biographers assert that, before the age of twenty, he was able to read the 'Principia,' and that he had discovered the method of fluxions, without being aware that this had been already done by Newton and Leibnitz.

In 1769 Mr. Rittenhouse was made one of a

Committee appointed by the American Philosophical Society to observe the transit of Venus which was to take place in that year, and he was so fortunate as to witness the phenomenon in a temporary observatory which he built for the purpose. The title of doctor of laws was subsequently conferred on him, and he was made a member of the American Academy of Arts and Sciences at Boston, in 1782. He was elected a fellow of the Royal Society of London, in 1795; and in 1791 he succeeded Dr. Franklin as president of the American Philosophical Society, to whose 'Transactions' he contributed many papers, chiefly on astronomical subjects. In the following year, he was made director of the mint of the United States; but in 1795 he was obliged to resign this appointment from bad health, and, after a short illness, he died June 26, 1796.

RITUAL (from *ritus*, in the sense of *consuetudo*), the book which directs the rites and ceremonies to be observed in celebrating divine service in any particular church.

RIVE-DE-GIER. [Loire.]

RIVER. In a legal sense rivers are divisible into fresh and salt-water rivers. Salt-water rivers are those rivers or parts of rivers in which the tide ebbs and flows. Rivers are also divisible into public or navigable rivers and private rivers.

The property in fresh-water rivers, whether public or private, is presumed to belong to the owners of the adjacent land; the owner on each side being entitled to the soil of the river, and the right of fishing as far as the middle of the stream. But this presumption may be rebutted by evidence of special usage to the contrary. Though fresh-water rivers are presumed to be the property of adjacent landowners, yet such owner cannot set up a ferry and demand a toll unless by prescription or by charter from the king.

In those rivers which are navigable, and in which the public have a right to a passage, the king is said to have 'an interest in jurisdiction,' and this is so not only in those parts of them which are the king's property, but also where they are become private property. Such rivers are called 'royal rivers,' because of their being dedicated to the public use, and all things of public safety and convenience being under the king's care. Navigable rivers are in like manner the king's highway by water. It does not follow from the fact of a river being a public navigable river, that there is a right at common law for parties to use the banks of it as a towing-path.

If a river which is private in use as well as in property be made navigable by the owner, it does not therefore become a public river, unless from some act it may be presumed that he has dedicated it to the public. The taking of toll is such an act.

In all rivers as far as the tide flows, the property of the soil is in the king, if no other claims it by prescription. In navigable rivers where the tide flows, the liberty of fishery is common to all persons.

The mere running water belongs to no one, but the proprietor of adjoining land is entitled to the reasonable use of it as it runs by his land.

RIVER-HORSE. [Hippopotamus.]

RIVERS are the flowing waters which bring to the sea, and sometimes to a lake, the waters which are collected within a certain portion of the earth's surface. The country which is drained by a river is called its *Basin*. The margin of such a basin generally lies contiguous to the basin of another river, and thus constitutes the boundary-line of the two basins. From these margins the waters descend on both sides into their respective basins, and hence the complex line formed by these margins is called a *Watershed*.

The basins of rivers vary greatly in size. A *Brook* is the name commonly given to rivers of the smallest description. If the waters should be increased by those of another brook, the name of brook is changed for that of *Rivulet*. When several rivulets unite and so produce a considerable volume of running water, this watercourse takes the name of *River*. But all such rivers do not reach the sea or even a lake; most of them join other rivers, and thus a large river is produced. This last-mentioned large river is called the *principal river*, and those which increase its waters are called, with respect to it, *Affluents*, *Tributaries*, or *Feeders*.

The first waters of a river are generally derived from a spring, which breaks out at the foot or on the side of some hill or mountain; and sometimes from a swamp or a lake. This is called the *source* of a river. From this source the river descends through the lowest part of its basin until it terminates its course in the sea, a lake, or another river, and this termination is called the *mouth* of the river. The cavity in which the running water flows is called the *bed* of the river, and the solid land that bounds this bed, the *banks*. The banks are distinguished by the appellation of *right bank* or *left bank*, according as they are on the right or on the left hand of a person moving down the stream. The terms north bank, east bank &c., frequently applied to rivers, are inexact and improper, for they would imply that a river might have more than two banks.

Most large rivers have their origin in very high mountains or table-lands, in descending from which a great difference with respect to the rapidity of their course and the nature of the country traversed by them is observed. Accordingly geographers divide the whole of the course of such rivers into three divisions, the *upper*, *middle*, and *lower* course.

The *upper* course of such a river lies within a mountain region, and its source is consequently at a great elevation above the sea. The waters run with greater or less velocity, according to the greater or less extent of the mountain region, and the greater or less rapidity with which the whole region declines towards the country to which the course of the river is directed. When the elevation of the mountain-region decreases with great rapidity, the current of the river is extremely rapid, and presents a quick succession of cataracts and rapids. The force of the current is so great that pieces of rock of considerable size, which are frequently detached from the overhanging masses, cannot resist it, and are carried down by

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the current, until they reach a point where the rapidity of the descent begins to diminish. The course of the river is generally in a straight line, but sometimes it makes short and abrupt bends which form acute angles. In the last-mentioned case it is, almost without exception, observed, that the mountains which enclose the river have on one side a projection, and on the other a recess corresponding so exactly, that if it were possible to unite both mountains, the projecting would exactly fit into the receding part. This peculiarity in the formation of the ravines of mountain streams was observed by the Spaniards in the Andes of South America, who called them *quebradas*, or broken; by this term tacitly assuming that the phenomenon had been caused by a violent disruption of the mountains.

When the mountain-region through which the upper course of a river lies descends with less rapidity, and consequently occupies a much greater extent of country, the mountain streams, as well as their banks, present very different features. Both the streams and the bank show that the descent of the whole mass is not by a regular slope, but by an alternation of plains and declivities; in ascending such a mountain-stream, it is found that in certain places the rocky masses approach so near to the banks, as to leave hardly room enough for the river, and in these narrows the current is extremely swift and generally a continual rapid, interrupted by falls of moderate height. These narrows however rarely extend more than a few miles. Above them the mountains recede to some distance from both sides of the river; and thus a basin is formed, in the middle of which the river flows with a comparatively slow current, not over bare rocks, but over a gravelly bed, and between low banks of earth. The bottom of the basin is level, or descends with a gentle slope, and may be cultivated or used as pasture-ground. In some of the rivers which descend from the central and eastern Alps, this alternation of narrow passes and basins occurs several times.

In some places the elevated mountain-regions border immediately on low plains. In such cases the rivers cannot be said to have a middle course; for as soon as they reach the plain their character is changed, and the rapid torrent is converted into a gentle stream. This is the case with the Marañon or Amazonas, the Ganges, and most of the rivers which descend from the southern declivity of the Alps to the Po. In most cases however the mountain-regions are not in immediate contact with the plains, but are separated from them by hilly tracts, and that portion of the course of a river which lies through such a hilly region is called the *middle* course. The rocky masses rarely approach the bed of a river that has a middle course, but retire to some distance from it, so as to form a wide valley, which the inundations of the river have covered with a thick layer of alluvial soil. It is remarkable that the highest ground of these valleys occurs, without exception, on the very banks of the rivers, and that the land slopes from them towards the base of the higher grounds. Accordingly the inundations generally cover the lower tracts, which are at some distance from the river, to the depth of several feet, while the banks are still above the surface of the water. The bed of the river rarely lies in a straight line, but continually forms bends, which are not acute angles as in the case of the mountain streams, but have only a small curvature, so that the river runs through the valley in a serpentine course. This circumstance at the same time lengthens the course of the river and diminishes the rapidity of the current.

It is observed that rivers form numerous small islands and sand-banks a short distance below the place where they issue from the mountain-region. This is accounted for, by observing that the river, on issuing from the mountains, retains a large quantity of earthy matter in suspension, which subsides when the current decreases in rapidity. This sediment forms islets and sand-banks. It sometimes but rarely happens that the rocky masses approach close to the banks in the middle course of a river; when this does happen at such places the river usually forms rapids and whirlpools. A ledge of rocks traverses the bed of the river in some places. Such ledges occur in the Danube, the Rhine, the St. Lawrence, the Potomac, and many other large rivers. The elevations by which they are produced are sometimes connected with ranges of hills. Ledges of this description mark with precision the passage of the rivers from the undulating or hilly region to the low plains along the coast. There are of course rapids where these ledges occur.

The *lower* course of rivers usually lies through a plain. In general there are no hills which constitute the outer margin of its course, and consequently there is no bottom or valley through which it runs. The banks are very little raised above the surface of the waters, and the level ground extends to a greater distance. The current is slow, the fall being very small. Thus the Amazonas, from the narrow at Obydos to its mouth, a distance of 700 miles, does not fall quite 12 feet. The surface of the plain through which a river runs generally consists of an alluvium, which the river has deposited during inundations. The matter of which this alluvium consists is soft and loosely bound together, and consequently the current, slow as it is, has power enough to remove a portion of the banks from one side, and to deposit the detached matter on the other. Thus great changes are produced in the course of rivers in the lapse of time. A river frequently divides into a number of *arms*, each of which runs to the sea, though some branches reunite and again detach themselves from one another. This is seen in the cases of the Danube, the Ganges, the Volga, the Orinoco, the Nile, &c. The country enclosed by the arms of a river is called its *delta*, from the Greek letter Δ, which the delta of the Nile, and most river deltas resemble in form. [DELTA.]

Most rivers overflow the low countries which are adjacent to their banks, either at regular seasons of the year, or occasionally. This takes place from one of three causes—the melting of snow and ice, as in the cases of the Nile, the

Mississippi, and Niemen; the heavy periodical rains which fall within or near the tropics; and lastly the occasional heavy rains of temperate climates, aided in some instances by sudden thaws. The intertropical rivers which are swollen by periodical rains, lie only in one hemisphere, the northern or the southern. During part of the year the land along their banks is dry and easy of cultivation; at another it is fertilised by the inundations. The Marañon is an exception to this remark; it is in fact always in a state of flood; its affluents, extending far both into the southern and the northern hemispheres, bring their tributes, gathered from the great equatorial and tropical rains, successively to its mighty channel, and thus the deep alluvial soil along its banks is kept in a state of continual moisture, forming interminable swamps, so that along the river, which has a greater extent of navigation than any other in the world, there is scarcely a single agricultural or civilised settlement.

Seafaring vessels can ascend many rivers as far as the tides extend. Indeed some rivers, as the Amazonas, may be navigated by large vessels to a much greater distance than the tide ascends, but in most the waters become shallow before the limit of tide-water is reached. In a few rivers the tide ascends to a great distance from the sea. In the Amazonas it is perceptible in the Narrow of Pauxis near Obydos, a distance of nearly 500 miles from the mouth of the river, measured along its course. The tide rushes into some rivers with great impetuosity, and produces what is called a *bore*. [Bore.]

RIVES. [Ise're.]

RIVESALTES. [Pyre'ne'es, Hautes.]

RIVIERA. [Genoa.]

RIVOLI. [Torino; Verona.]

RIZI, DON FRANCISCO, a Spanish painter, was born at Madrid in 1608. He was the pupil of Vincenzo Carduccio, and in 1656 was appointed principal painter to Philip IV. He held the same place under Charles II.; and was appointed in 1653 painter to the cathedral of Toledo, a post often in Spain more important than that of painter to the king. Rizi is however one of those painters to whom the decline of painting in Spain is attributed, through the mere superficial attractions of his works. Rizi's last commission was for the great altarpiece of the Retablo de la Santa Forma, in the Sacristy of the Escurial, which Charles II. ordered for the veil of the magnificent tabernacle and altar, which Rizi had also assisted in making, to contain the Host (La Santa Forma); but he died the following year at the Escurial, having only executed the sketch. [Coello, Claudio.]

The pictures, both frescoes and in oil, by Rizi, are very numerous. There are several in the Museo of the Prado at Madrid, and many in the churches of Madrid and Toledo, especially in the cathedral of Toledo.

Fray Juan Rizi, Francisco's elder brother, born at Madrid in 1595, was also an eminent painter. His principal works are in the Benedictine Monastery of San Martin at Madrid. He retired to Rome and joined the Benedictines of Monte Casino. He was, while in Italy, made an archbishop, in 1675, by the Pope Clement I., but he died in the same year at Monte Casino.

RIZZIO. [Mary Stuart.]

ROACH. [Leuciscus.]

ROAD. [Way.]

ROANNE. [Loire.]

ROASTING. In the process of broiling meat, the heat is applied immediately and suddenly to the surface, by which it is hardened, so that the juices of the meat are greatly retained, evaporation being thereby prevented; while in roasting, the heat is applied gradually, the watery portion is evaporated, as well as the fat melted out to a considerable extent, till the progressive browning and hardening of the surface prevent the further escape of the juices. The loss of weight in roasting meat is much greater than by boiling, much of the fat being melted out and water evaporated, but the nutritious matter remains condensed in the cooked solid; whereas, in boiling, the gelatine is partly abstracted. Roasted meat is therefore more nutritive than boiled meat, and also more digestible.

ROATAN, or Rattan, is an island in the Caribbean Sea, opposite the coast of Honduras, one of the states of Central America. It lies between 10° 5′ and 10° 10′ N. lat., and between 86° 5′ and 86° 25′ W. long., and extends about 20 miles long by 5 in width. This island is one mass of rocks, but covered with a deep soil, which, united to a moist and warm climate, produces an unusual activity of vegetation. The woods abound with animals, and the coasts with fish. On the southern shores are three small harbours, Port Royal, Dixon's Cove, and Cozen's Cove. This island was discovered by Columbus on his fourth voyage, in 1502. Settlements have been made in it from time to time, but it is now nearly uninhabited.

ROBBERY is now considered to be theft aggravated by the circumstance of the property stolen being taken from the person, or whilst it is under the protection of the person, of the owner or other lawful possessor, either by violence or putting in fear. This offence appears to have been formerly confined to cases of actual violence to the person, but it is now extended to constructive violence by putting in fear; and not only to cases where property has been taken or delivered under a threat of bodily violence to the party robbed or to some other person, but also where the fear has resulted from apprehension of violence to his habitation or to his property, or where it has been occasioned by threats of accusing the party of the commission of an infamous crime.

The party robbed may without any formality retake his goods wherever he can find them, unless they have been waived or thrown away by the robber during his flight, or seized by the officer of the king or of the lord of the franchise, or sold in open market. But after such waiver, seizure, or sale, the owner cannot retake them of his own authority. Where there has been no improper neglect to prosecute, the party will in general be entitled to his writ of restitution. [Restitution.] The party robbed cannot sue for

the goods stolen or their value against the robber or any person who may have acquired the goods stolen from the robber, unless he has done all in his power to bring the offender to justice.

Under 7 Wm. IV. and 1 Vict., c. 87, s. 5-10, robbery is punishable by transportation for life or for any term of years not less than seven, or by imprisonment for any term not exceeding three years, and for any period of solitary confinement during such imprisonment not exceeding one month at a time, or three months in the space of one year, at the discretion of the court or judge, by or before whom the offender may be tried; but by sect. 4, where the robbery is effected by threatening to accuse the party of an infamous crime, the period of transportation is for life or for a term not less than 15 years. By the same, statute, s. 6, assaulting with intent to rob, and, by s. 7, demanding any property of any person by menaces or by force, is made felony punishable by imprisonment not exceeding three years.

By the same statute, s. 2, the punishment of death is imposed upon the offence of robbing any person, and at the time of or immediately after such robbery stabbing, cutting, or wounding any person.

Upon an indictment for robbery, as well as for any other felony which includes an assault upon the person, the jury are authorised by 7 Wm. IV. and 1 Vict., c. 85, s. 11, to acquit of the felony, and to find a verdict of guilty of assault, against the party indicted, if the evidence will warrant such finding; for which assault the party may be sentenced to imprisonment for any term not exceeding three years.

ROBERT, king of France, was elected king on the death of his brother Eudes, by that party of the French who rejected the claims of Charles le Simple. [CHARLES III.] He fell in battle against his competitor, Charles le Simple, near Soissons, June 15, 923, having reigned scarcely a year. He was grandfather to Hugues Capet, founder of the third or Capetian race of French kings.

ROBERT, king of France, surnamed *le Sage* (the Wise), and *le Dévot* (the Devout), was son of Hugues Capet, whom he succeeded on the throne in 996. The most remarkable occurrences of his reign were—his excommunication by the Pope for refusing to divorce his wife Bertha, the widow of Eudes, count of Blois, to which, after some resistance, he was obliged to yield, and divorce his wife; his acquisition of the Duchy of Bourgogne after a war of thirteen years; and his persecution of Jews and heretics, in which he is believed to have been influenced by his second wife, Constance, the beautiful but imperious and vindictive daughter of the Count of Toulouse. Robert's latter days were embittered by the rebellion of his three sons, Hugues, Henri, and Robert. He died at Milan in 1031.

ROBERT I., King of Scotland. [BRUCE, ROBERT.]

ROBERT II., the first king of Scotland of the House of Stewart, was born March 2, 1316, and was the son of Walter, the Stewart of Scotland, and his wife Marjory, daughter of King Robert Bruce. Robert, the Stewart, acted a principal part throughout the troubled reign of David II. While yet only a youth of sixteen, he commanded the second division of the Scottish army at the decisive battle of Halidon, fought and lost by the Scots in July, 1333; and after that fatal day he was one of the first to uplift again the standard of the national independence. He acted as regent for several years during the exile of the king; at first in conjunction with the Earl of Moray, and afterwards independently. The king, on the expulsion of Edward Balliol, was restored in 1341, and in 1346, after his capture at the battle of Neville's Cross, the Stewart was again elected regent, and he held this post till the release of David, in 1357, governing the country with remarkable prudence and ability. In 1359 the earldom of Strathearn was conferred upon him; and upon the death of the king (Feb. 22, 1371), without issue, the Stewart was declared his successor.

Robert II., when he thus succeeded to the throne, was somewhat peculiarly situated in regard to his domestic relations. His first wife was Elizabeth, daughter of Sir Adam Mure, of Rowallan; but the family he had by her, consisting of four sons and six daughters, had all been born before their marriage; and the legality of the marriage itself was also denied on the ground of affinity. The children were legitimatised by a papal dispensation; but on the obviously fictitious ground that the parents, while living together, were ignorant of their relationship. This dispensation by no means satisfied the popular feeling at the time; and many believed the issue of Euphemia Ross, whom Robert subsequently married, and their descendants, to be the true heirs to the crown. Robert however caused the states soon after his succession to pass an act, recognising John, earl of Carrick, his eldest son by Elizabeth Mure, as his successor; but in 1373 another act entailed the crown on his heirs male of both families in succession. (See 'Tracts, Legal and Historical, with other Antiquarian Matter, chiefly relative to Scotland,' by John Riddell, Esq., Advocate, 8vo, Edinburgh, 1835; dissertation iii., entitled 'Remarks upon the Law of Legitimation per Subsequens Matrimonium, the Nature of our Ancient Canons, and the Question of the Legitimacy of the Stewarts.')

A truce for fourteen years had been concluded with England two years before the death of the late king; but on the accession of Richard II. war was renewed, and was continued, with the intermission of an occasional truce, without any decisive advantage being gained on either side, for more than twelve years. In 1388 the famous battle of Otterbourne, or Chevy Chace, was gained from the Percies, though at the expense of his own life, the Earl of Douglas. By this time however the reins of government had nearly dropped from the by hands of King Robert. Froissart tells us that, being unfitted by his years and broken health for going out any more to war, he was no longer consulted in public affairs by the nobles. In 1389 the Earl of Fife (afterwards Duke of Albany) was formally recognised as governor of the kingdom by an assembly of the estates held at Edinburgh.

The war with England was prosecuted by the regent for some months with considerable vigour; but hostilities were terminated for a time, in June, 1389, by a truce concluded between France and England for three years, in which the allies of both powers were comprehended. The country was therefore at peace when Robert II. died, after a short illness, at his castle at Dundonald in Kyle, Ayrshire, April 19, 1390. Robert II. was succeeded by his eldest son Robert III.

ROBERT III., king of Scotland, the eldest son of Robert II., relinquished his original name of John, on account, it is said, of a popular superstition of his countrymen which regarded that name as unlucky or ominous. He was probably born before 1340, so that he was past fifty when he came to the throne in 1390. No events of any note mark the first eight or nine years of his reign, during the whole of which the king's brother, the Earl of Fife, continued to retain the management of public affairs. The war with England broke out again on the accession of Henry IV. in 1399. In August of the following year, Henry entered Scotland at the head of a powerful army, and advanced as far as Edinburgh, which was however successfully defended by the king's eldest son, the Duke of Rothsay. In the following year however Henry Percy (Hotspur) made a more destructive inroad as far as Preston in East Lothian. On this occasion Percy was joined by the Scottish Earl of March, who had recently gone over to the English king, in a fury of revenge against the Duke of Rothsay, who, after having been affianced to his daughter, had married a daughter of the Earl of Douglas. The following year, 1402, is memorable for the tragical catastrophe of Rothsay, who, at the instigation of his uncle Albany, the friend of the Earl of March, was seized under an order professing to be signed by his father, and is believed to have been left to perish of famine in the castle of Falkland, at the age of 24. A few weeks after the prince's death, a pardon or remission in very ample terms for any concern he might have had in this affair was granted by the king to Albany; and has been published by Lord Hailes in chapter vi. of his 'Remarks on the History of Scotland,' Edinburgh, 1772. In this remarkable paper it is stated that Albany admitted the capture and arrest of the prince, but justified what he had done by reasons which the king did not then hold it expedient to publish to the world. In the course of the following two years, in consequence of the successes of the English, attempts were made to arrange a peace between the two countries, but without success. Hostilities however had been for a considerable time suspended by these negociations, when King Robert resolved to send his only surviving son James, earl of Carrick, to France; and the prince, then in his 11th year, was captured at sea by an English vessel, March 30, 1405. His detention by King Henry is believed to have broken the heart of his father, who expired at the castle of Rothsay in Bute, April 4, 1406. He was succeeded by his son, James I.

ROBERT (GROSSETESTE), bishop of Lincoln, a scholar and prelate in the early years of the reign of Henry III., was probably born about the year 1175. He studied at Oxford, and went thence to Paris. He returned to England skilled in English, French, Latin, Greek, and Hebrew, and also in logic and philosophy, divinity and the Scriptures, with considerable knowledge of medicine and ecclesiastical law. He obtained preferment in the church, and in 1235 succeeded his patron, Hugh de Wells, in the bishopric of Lincoln, then a diocese of very large extent. This dignity he held for 18 years. He died in 1253.

Bishop Grosseteste was a great reformer of his diocese, a vigilant superintendant of his clergy, a maintainer of order among them and in all ecclesiastical affairs. He was one of the great benefactors to the English church and nation in the discharge of his duties as a bishop. Many of his writings have been printed, and many remain in manuscript, and are found in most of the great libraries of Europe. An ample list of these is given in Dr. Pegge's 'Life' (4to., 1793).

ROBERT OF GLOUCESTER is supposed to have been a monk in the abbey there, but of his personal history nothing whatever is certainly known. He seems to have lived in the reign of Edward I. The only writing attributed to him is a 'Chronicle' of English affairs from the beginning, including the fables of Geoffrey of Monmouth, and extending to the commencement of the reign of Edward I. It is in the vernacular language of the time; and this and the similar work of Robert of Brunne, are the best specimens which remain of the language of the time. It is in verse, and consists of more than ten thousand lines.

The 'Chronicle' of Robert of Gloucester was popular in the middle ages, as appears by the number of manuscripts that still exist of it. The principal are the Bodleian, the Cottonian, and the Harleian; and there is also one in the library of the Herald's College. It was published by Hearne, Oxford, 1724, 2 vols. 8vo.

ROBERT, HUBERT, was born at Paris, in 1733. On quitting school, Robert applied himself to the study of the arts of design. In 1753 he set out for Rome, and spent twelve years in that city, occupied not merely in making drawings and views of nearly all the numerous architectural monuments, but studying their character completely. On his return to Paris, he was immediately elected by the Academy, and his reputation became established as an architectural draughtsman. Two of his most remarkable works are those representing the Musée Napoleon, the one in all its pride and pomp, and the other, an architectural wreck, as it may perhaps present itself to the eye after the lapse of centuries.

Robert, in the active exercise of his profession, passed a life unmarked with stirring events, and died April 15, 1808.

ROBERT, LEOPOLD, was born at Chaux-le-Fonds, in the canton of Neufchâtel, in 1797. His father intended to bring him up to his own trade (that of a watchmaker), but yielding to the boy's decided inclination for the arts, sent him to Paris to study engraving under Girardet. His progress

was so rapid, that in 1812 he obtained the second grand prize at the École des Beaux-Arts, after which he began to study painting in the school of David. He then proceeded to Italy, and devoted himself entirely to his pencil. Though he worked much, he produced little. He is said to have spent between three and four years on a single picture; for instance, that of the 'Reapers,' which excited so much admiration when first exhibited at Paris in 1831. He was especially happy in his delineation of Italian life, and never more so than in his last work, the 'Venetian Fishermen.' The general enthusiasm which it excited when exhibited at Paris, was however mingled with regret at the fate of the artist, who had previously drowned himself at Venice, March 20, 1835.

ROBERTSON, WILLIAM, was born in 1721, at Borthwick in Scotland, of which place his father was minister. He studied under Mr. Leslie of Dalkeith; and in 1733, on the appointment of his father to one of the churches of Edinburgh, he was placed at the university of that city. In 1742 he was presented to the living of Gladsmuir, in East Lothian. He soon distinguished himself as a preacher, and also as one of the most powerful speakers and most eminent leaders in the General Assembly of the Church of Scotland. He also applied himself to historical studies, and in 1759 published his 'History of Scotland during the reigns of Mary and of King James VI. till his accession to the crown of England, with a Review of the Scottish History previous to that period, and an Appendix containing original Papers,' 2 vols. 4to., 1759. In 1761 Dr. Robertson was made one of the king's chaplains, and in 1762 he was appointed Principal of the university of Edinburgh. Two years after he was made historiographer to his majesty for Scotland, with a salary of 200*l*. In 1769 he published his 'History of Charles V.,' in 3 vols. 4to., a work which greatly raised his reputation. For his 'History of America,' 2 vols. 4to., 1777, Robertson obtained, through several friends, much valuable information from the Spanish and other archives. In 1785 he published some valuable 'Additions and Corrections to the former Editions of the History of Scotland.'

His celebrity as an author, and the powers which he displayed as a party chief in the church, gave rise to a proposition from the court, at the end of George II.'s reign, having for its object his promotion to the dignities of the English church. This proposition met with such a repulse from Robertson as effectually prevented a repetition of the attempt.

In 1791 Dr. Robertson published an 'Historical Disquisition concerning the Knowledge which the Ancients had of India, and the progress of Trade with that country previous to the Discovery of the Cape of Good Hope.'

Dr. Robertson died at Grange House, near Edinburgh, in June, 1793. He is justly reckoned among the best British historical writers.

ROBERVAL, a French mathematician, whose proper name was GILES PERSONIER. He was born in 1602, at a place called Roberval, in the diocese of Beauvais, and went, in 1627, to Paris. He was chosen professor of mathematics in the college of Gervais, which had been founded by Ramus at Paris, and, together with this appointment, he was allowed to hold, after the death of Morin, the chair of mathematics at the college of France. He was an original member of the Academy of Sciences, and died in the year 1675.

None of Roberval's works were printed during his life, except a treatise on Statics, which was inserted by Mersenne in his 'Harmonie Universelle.' The others were published by his friend the Abbé Galois, in 1693, among the mathematical and physical works in the old 'Mémoires' of the Academy of Sciences. Roberval is a remarkable mathematician among the immediate precursors of the invention of fluxions, but though he aided progress, his discoveries were of a character which cannot be briefly and separately described.

ROBES, MASTER OF THE, an officer of the household who has the ordering of the king's robes. Under a queen, the designation of the office is changed to that of a Mistress of the Robes.

ROBESPIERRE, FRANÇOIS MAXIMILIEN JOSEPH ISIDORE, was born at Arras in 1758. His father, a provincial advocate, quitted his home during the infancy of his children, who were not long afterwards left in a desolate condition by the death of their mother. François Maximilien was the eldest son, and Augustin Bon Joseph the second. There were also two sisters.

Through the kindness of the Bishop of Arras, Robespierre was educated at Paris, at the college of Louis-le-Grand. He studied law, and having returned to his native town, followed his father's profession. On the summoning of the States-General at Versailles, in 1789, he was elected a deputy of the Tiers-État. It was some time before he gained any influence in the assembly. He had no personal advantages: he was a short insignificant-looking man; his features small, his complexion pale, his face deeply marked with the small-pox, and his voice harsh, shrill, and disagreeable. He was very poor, but he was above a bribe, and hence he got the name of the Incorruptible. It was on the 17th of June, 1789, that he delivered his first speech in the Assembly. From that time he threw aside the backwardness and reserve that he had hitherto maintained; but though he was in favour of great changes, he was not at first a republican. His importance in the Assembly was in a great measure attributable to the prominent part which he played in the Jacobin Club. This club already contained so many members, that the large church in which its meetings were held was filled, and it had corresponding affiliated societies throughout the provinces, which disseminated its views and projects, and rendered its power formidable. Robespierre's exclusion from the Legislative Assembly, to which he was rendered ineligible by a vote in which he himself had joined, enabled him to devote his whole time and energies to the direction of the Jacobin Club.

When the attack was made upon the Tuileries

(Aug. 10, 1792), Robespierre was out of the way. It was his custom neither to take an active part in any violence, nor to appear immediately after; a line of policy to which he was led both by his natural timidity and his great caution. It was with joy that he saw the National Assembly suspend the royal authority and call upon the nation to elect a Convention which should determine on a new form of government. He became a member of the Convention; and, on its opening (Sept. 21, 1792), seated himself on the 'montagne,' or higher part of the room, occupied by the most violent, which was also rapidly becoming the most powerful party. It was now that Robespierre appeared in the first rank: until now, he had had superiors even in his own party—in the days of the Constituent Assembly, the well-known leaders of the time, and during the continuance of the Legislative Assembly, Brissot and Pétion. In the first assembly he could attract notice only by the profession of extravagant opinions; during the second he became more moderate, because his rivals were innovators; and he was in favour of peace with Austria, because his rivals called for war. His chief aim now was to annihilate the Girondins, who hoped, on the other hand, that the eminence which he had attained might be made the means of his ruin. Barbaroux, Rebecqui, and Louvet, dared to accuse him of seeking to be dictator. But the time had not come for accusations to be successful; the tide of his popularity had not turned. He demanded time to prepare his defence, and absented himself for eight days both from the Convention and the Jacobin Club. During this absence the Jacobins intimidated his accusers, the excitement in the Convention subsided, and on his reappearance he was triumphantly exculpated.

In the matter of the trial of Louis XVI., Robespierre combated those who either asserted the necessity of a trial or declared the king inviolable: he was consistent in his logic, but cold and cruel. He voted for the king's death. The death of the king augmented both party strife and private bitterness; each faction and each leader had some rival to destroy. The Montagnards struggled with the Girondins for supremacy, and ended by bringing them to the scaffold. The government fell into the hands of the Committee of Public Safety, of which Robespierre, Couthon, and St. Just, were three of the most powerful and active members. Robespierre's popularity was apparently at its height on the day when he officiated at the great festival of the Supreme Being on the 8th of June; but his days were nearly numbered. In July, 1794, his adversaries became too strong for him. Billaud-Varennes, one of his own party, jointly with the remnant of the Dantonists, who still were furious because of the execution of their leader, accused Robespierre of seeking his own aggrandizement by the sacrifice of his colleagues. Robespierre's last address to the Convention in his defence is a singular production, which, with his other discourses, helps us to estimate his true character. His enemies however had got him in their hands; and he was condemned without trial, and executed with his brother, Couthon, St. Just, and others, on the 28th of July (10th Thermidor), in the Place de la Revolution. The character of this man and his political career require a volume. He was neither what many have called him, a mere bloodthirsty wretch, nor yet altogether an honest man. He was honest to a certain extent; he was a fanatic, with false notions of the nature of human society. He was a moral preacher, and yet not a Christian, except after the fashion of Rousseau. An article in the 'Quarterly Review' (vol. liv.), which is very unfavourable to his character, has pointed out many curious particulars in his life, and corrected some errors. The work of Michelet on the French Revolution will help the reader to understand this singular man. The 'History of the Girondins,' by Lamartine, is more a work of fiction than a history. The best exposition of Robespierre's character is to be found in his speeches or addresses, a great number of which were printed at the time; and many of them are given in the 'Histoire Parlementaire.' Long's 'History of the Revolutions of France' traces the career of Robespierre from his appearance in the National Assembly to his death on the scaffold.

ROBIN HOOD. [Hood, Robin.]

ROBI'NIA, a genus of plants consisting of North-American trees. The best known species of Robinia is the *R. pseud-acacia*, the Bastard or False Acacia, or Locust-Tree. It was named Locust-Tree by the missionaries, who supposed it to be the same tree as that which grows in Asia, and is supposed to have produced the locusts spoken of in the New Testament. It was one of the first trees received in Europe from North America. It grows in the Atlantic States of North America, and is abundant in the south-west, in the valleys of the Alleghany Mountains. It is also found in the western states and in Upper and Lower Canada.

Since its first introduction into Europe, this tree has met with very different treatment, at one time being extolled as the most valuable of trees, at another time condemned as worthless. This has arisen in a great measure from the soils and situations in which it has been accidently cultivated. It has always been known in America as affording an exceedingly hard and durable wood; hence it has been recommended to be cultivated on this account, but it has a great tendency to form branches, and it seldom attains a great size. In America it is used for making posts, and occasionally trees are found large enough to be employed in ship-building; but its greatest consumption is for making trenails, by which the timbers of ships are fastened together, and for this purpose large quantities are used in the royal dock yard at Plymouth, for which purpose they are imported from America.

The tree is of rapid growth when young, and forms heart-wood at a very early age. In America it attains a height of 70 or 80 feet, but in this country it is seldom seen so high.

The roots and other parts of the plant, like many of its order (*Leguminosæ*), contain a saccharine principle.

There are two other species frequently cultivated in this country, *R. viscosa*, Clammy Robinia, and *R. hispida*, Hairy Robinia, or Rose Acacia.

ROBINS, BENJAMIN, a celebrated mathematician and artillerist, was born at Bath, in 1707, of parents who were members of the Society of Friends, and in such humble circumstances as to be unable to give their son the benefits of a learned education. By the aid however of some occasional instruction and a mind by nature formed to comprehend readily the processes of mathematical investigation, he early attained to a considerable proficiency in the pure sciences. Arriving in London about the year 1725, Mr. Robins, apparently in the intervals of his employment as a teacher of mathematics, diligently cultivated the higher departments of science by reading the works of the ancient and the best modern geometers; and in 1727 he distinguished himself by writing a demonstration of a proposition in Newton's 'Treatise on Quadratures.'

Soon afterwards, Mr. Robins began to make those experiments for determining the resistance of the air against military projectiles, which have gained for him so much reputation; and, in 1742, he published his principal work, entitled 'New Principles of Gunnery.' To this is prefixed an account of the rise and progress of modern fortification, and a history of the invention of gunpowder. Having determined the value of the explosive force of fired gunpowder, he proceeds to describe the ballistic pendulum which he had invented, with the manner of employing it in determining the velocities of shot when the guns are charged with given quantities of powder; and he treats at length of the resistance of the air on shot and shells during their flight, a subject till then but little understood. This work had the honour of being translated into German, and commented on by the learned Euler. In 1735 he published 'A Discourse concerning the Certainty of Sir I. Newton's Method of Fluxions;' and, four years afterwards, some remarks on Euler's 'Treatise of Motion,' on Smith's 'Optics,' and on Dr. Jurin's 'Discourse concerning Vision.'

Mr. Robins was offered, in 1749, his choice between two good appointments; the first, to go to Paris as one of the commissioners for settling the boundaries of Acadia; and the other, to be engineer in general to the East India Company. He accepted the latter, and departed in December for Madras, where he arrived in July, 1750. His intentions were to put the fortifications in a good state of defence, and he had actually prepared plans for the purpose when he was taken ill with a fever. He recovered from this attack, but soon afterwards fell into a declining state, and died July 29, 1751, aged 44.

ROBISON, JOHN, was born in 1739, at Boghall in the county of Stirling. He took his degree of M.A. in 1756, at the university of Glasgow, but would not obey his father's wish, which was to enter the church.

Being compelled to seek an occupation in some other line, he went to London in 1758. He served for some time in the navy as instructor to a son of Admiral Knowles, and was rated as midshipman. In this capacity he was in the fleet sent to co-operate with Wolfe against Quebec; and when, in May, 1759, the fleet arrived in the St. Lawrence, Mr. Robison was employed in surveying the river and the neighbouring country; at the same time he had an opportunity of making observations concerning the effects produced by the aurora borealis on the magnetic needle.

In 1762 it was proposed by the Board of Longitude to try Harrison's new time-keeper during a voyage to the West Indies, and Mr. Robison was recommended by Admiral Knowles as a proper person to take charge of it. He accordingly, accompanied by a son of Mr. Harrison, sailed to Jamaica, where, on Jan. 26, 1763, the chronometer (whose rate had been determined at Portsmouth, Nov. 6, 1762) was found, after allowing for that rate, to indicate a time less by 5″ only than that which resulted from the known difference between the longitudes of the two places; and on his return to England, April 2, 1763, that is, after an absence of one hundred and forty-seven days, the whole error was found to be but 1′ 54½″.

Mr. Robison, being disappointed in his expectations of promotion from the Admiralty, set out for Glasgow in order to resume his studies. On the removal of Dr. Black to Edinburgh, Mr. Robison was appointed to succeed him, and for four years he gave lectures on natural philosophy at Glasgow; but at the end of that time he accepted (1770) the appointment of secretary to Admiral Sir Charles Knowles, who had been invited by the Empress of Russia to superintend the improvements in her navy. Two years after his arrival at St. Petersburg, Sir Charles became president of the board of admiralty, and Robison was made inspector of the corps of maritime cadets at Cronstadt, with a liberal salary and the rank of lieutenant-colonel in the Russian service. This duty he performed for four years, but finding Cronstadt a dreary place of residence during the winter, he accepted the professorship of natural philosophy at Edinburgh, where he arrived in June, 1774; and in the same year he gave a series of lectures on mechanics, optics, electricity, astronomy, &c.

On settling in Edinburgh, Mr. Robison became a member of the Philosophical Society of that city. In 1798 he was made doctor in laws by the university of New Jersey; in the following year, by that of Glasgow; and in 1800 he was elected a foreign member of the Academy of Sciences at St. Petersburg. In 1785 he wrote a paper in the first volume of the 'Philosophical Transactions of Edinburgh,' on the determination of the orbit and motion of the Georgium Sidus. But his most important works are the articles contributed to the third edition of the 'Encyclopædia Britannica;' of which the principal were collected, together with the most important of his other writings, and published by Sir David Brewster, under the title of 'A System of Mechanical Philosophy,' 1822. Mr. Robison died January 30, 1805.

ROBORTELLO, FRANCIS, was born of a noble family, Sept. 9, 1516. He was educated at Bologna under Romulo Amaseo, and began about 1538 to teach the belles-lettres at Lucca. In 1549 the senate of Venice elected him professor of rhetoric there. In 1552 he was promoted to the chair of Greek and Latin literature in the university of Padua. Thence he removed in 1557 to Bologna, in order to undertake a similar office in that city. About this time he had violent disputes with Sigonius, which did not terminate till the senate of Venice imposed silence upon both. Robortello died at Padua, March 18, 1567, so poor that he did not leave enough to defray the expenses of his funeral, which however was celebrated by the university in a style of great magnificence.

The following are his principal works: 1, 'Variorum Locorum Annotationes tam in Græcis quam in Latinis Auctoribus,' Venice, 1543, 8vo.; 2, 'De Historicâ Facultate,' &c., Florence, 1548, 8vo., being several treatises on Greek and Roman literature, all of which are inserted by Gruter in his 'Thesaurus Criticus;' 3, 'De Convenientiâ Supputationis Livianæ Annorum cum Marmoribus Romanis quæ in Capitolio sunt; De Arte sive Ratione corrigendi Veteres Auctores Disputatio,' Padua, 1557, folio; 4, 'De Vitâ et Victu Populi Romani sub Imperatoribus Cæs. Augustis,' Bologna, 1559, folio. Besides these he published editions of Aristotle's 'Poetics,' the 'Tragedies' of Æschylus, the 'Tactics' of Ælian, and Longinus 'On the Sublime.'

ROBUSTI. [Tintoretto.]

ROCAMBOLE. [Allium.]

ROCCELLA WEED. [Orchil.]

ROCHDALE. [Lancashire.]

ROCHEFORT. [Charente-Infe'rieure.]

ROCHEFOUCAULD, LA. [Charente.]

ROCHEFOUCAULD, FRANÇOIS, DUC DE LA, of a noble family of France, was born in 1613. His education was neglected, but nature supplied the deficiency. He appeared early at the court of Louis XIII., and showed talents and ambition, but was kept out of employment by the jealousy of Cardinal Richelieu. In the early part of the reign of Louis XIV. he figured in the civil war of La Fronde. After Louis XIV. had firmly established the monarchical authority, La Rochefoucauld withdrew to private life, where he exhibited virtues which atoned for the folly and violence of his younger years. He was intimate with Madame de la Fayette, and with Madame de Sévigné, who speaks of him, in her correspondence, in terms of real esteem. He died in 1680. La Rochefoucauld left several works, the principal of which are, 'Mémoires de la Régence d'Anne d'Autriche,' and his 'Maximes,' or 'Pensées.' This last book has been abused, criticised, controverted, and yet there is a great deal of truth in it, though it generalises too much. La Rochefoucauld attributes all the actions of men, good or bad, to the principle of self-interest. The 'Œuvres de la Rochefoucauld,' 1818, contain, besides his already published works, several inedited letters and a biographical notice.

ROCHELLE, LA. [Charente-Infe'rieure.]

ROCHESTER, a city in the county of Kent, the see of a bishop, a parliamentary borough, and municipal borough, is situated within a bend of the river Medway, on its southern or right bank, immediately adjacent to the parliamentary borough of Chatham [Chatham], with which it forms one continuous town. It is 31 miles E.S.E. from London by the North Kent Railway, of which the station is at Strood.

Rochester probably existed antecedently to the Roman invasion, at any rate antecedently to the conquest of the southern part of the island under Claudius. During the independence of the Saxon kingdom of Kent it was of importance both as the seat of a bishopric (established about A.D. 604) and as a place of strength. After the Conquest, William the Conqueror either built or more probably repaired and strengthened a castle here, and placed it under the command of his brother Odo, bishop of Bayeux.

The city stands chiefly on a low narrow tract which borders the Medway, and is backed by the chalk hills, which rise from the river with a rather steep ascent. It consists of several streets irregularly laid out, but well paved and lighted; the principal street leads from the bridge into Chatham, which it joins on the east.

The cathedral is situated on the western side of the High Street within the ancient Priory Gate. The nave is part of the structure of Bishop Gundulph, who rebuilt the cathedral near the close of the 11th century. The west front is a fine specimen of enriched Norman architecture; but the great west window is an insertion of perpendicular character, as are most of the other windows of the nave. The nave has Norman piers and arches, except in the part nearest the choir, where the arches are early English. Most of the eastern part of the church is of plain early English, of good composition, without much ornament. There are a few ancient monuments, singular rather than beautiful, and much mutilated. There are two parish churches in Rochester, St. Margaret and St. Nicholas; they are not remarkable for their architecture, but each has a very ancient stone font, and St. Margaret's contains several ancient monuments. Across the Medway is a stone bridge of eleven arches. The castle is on the bank of the Medway, just above the bridge, and contiguous to the cathedral. Its walls enclosed a quadrangular area nearly 300 feet square, and are, with their towers, now in ruins. The architecture is Norman, except perhaps the round tower at the south-eastern angle, which was rebuilt in the place of the original square one destroyed when King John besieged and took the castle. The walls of the keep are still standing, and are very thick and strong. The other public buildings are—a commodious town-hall, with a market-house beneath, and a small gaol adjacent; a clock-house, built by Sir Cloudesley Shovel on the site of a former town-hall; and a neat theatre. There are some remains of the city walls; and part of the fortifications of Chatham, especially Fort Pitt, are within the city.

Strood and Frindsbury, considerable portions of which have been added to Rochester both by

the Boundary and Municipal Reform Acts, are on the north-west side of the Medway; Strood on the London Road, and Frindsbury a little to the north-east. Strood has improved considerably of late years; it has a neat church. Frindsbury church is on an eminence commanding a fine prospect. Upnor Castle on the Medway is in Frindsbury parish: it consists of an oblong central building, with a round tower at each end, and is surrounded by a moat; it was used during the late war as a powder-magazine.

There are no manufactures in Rochester. Trading vessels come up to the bridge, where they discharge their cargoes, chiefly coals, which are conveyed up the river in small craft. The oyster fishery is carried on with great activity under the regulation of the corporation. Considerable quantities of oysters are sent to London or exported to Holland; a considerable quantity of shrimps also are sent to London. A canal was cut some years ago from the Medway to the Thames at Gravesend Reach, but the undertaking was not profitable. This canal was carried through the chalk hills by a tunnel two miles and one furlong in length, which commenced near Rochester Bridge, and is now used for the passage of the railway.

The corporation consists of six aldermen and eighteen councillors, one of the aldermen being mayor. The parliamentary borough returns two members: population 11,949. Population of the city, exclusive of Strood, 9,884. The population of Strood is 2,884.

ROCHESTER. [New York.]

ROCHESTER, LORD. [Wilmot.]

ROCHFORD. [Essex.]

ROCK-CRYSTAL. [Quartz.]

ROCK-PLANTS are those plants which are distinguished by growing on or among naked rocks, and are confined to no particular region or latitude. De Candolle observes that they pass by insensible gradations into the plants that inhabit walls, rocky and stony places, and even gravelly places, from which they pass into those that are found particularly on sands and barren soils. Most of the plants growing on rocks have but a small development of root, as they derive their nutriment principally from the air, through the medium of their leaves and stems. A large number of the *Cryptogamia*, especially mosses and lichens, belong to this class.

ROCK-SALT. [Sodium.]

ROCK-WORK, in Gardening, an elevation, composed of earth and other loose materials, and covered with stones and fragments of rock, &c., amongst which plants adapted for such a situation are grown. When the rock-work is managed skilfully, and in accordance with surrounding objects, it may be made to add much to the beauty and interest of the garden. In the first place a proper situation should be selected, and the character of the rocks should harmonize with the situation. Simple outlines and surfaces not broken into fantastic shapes, are best suited to show off the plants. In this respect hints should be taken from the natural rock-work that often meets us by the mountain side. Cones and peaks of unnatural shape and size should be avoided. A ground-plan in the form of a crescent or of an irregular figure is best; the middle portions should be the broadest and most elevated. When large portions are thus laid out, steps may be formed leading to basins of water on the sides or summits of the rock-work. These basins of water have two advantages: first, in permitting the growth of various aquatic plants; and secondly, in keeping the great mass of earth in the rock-work moist and cool. The best stones for rock-work are those which resist the action of the air, and they may be selected according to convenience from the rocks of the neighbourhood in which they are used. The most irregular ought to be chosen, especially those with cavities in them, which may be filled with earth for the growth of mosses, ferns, and small plants. Frequently stones are met with covered with lichens, which, from their picturesque colours, have a pleasing effect. Such stones are mostly large, and are best adapted for the base of the rock-work. Portions of ruins, antiquities, corals, petrifactions, and shells, are often introduced into rock-work, but they give it too much of an artificial character, and it is questionable whether they can ever be introduced among plants with good effect.

The natural order *Leguminosæ* affords a great number of plants fitted for rock-work. Almost all the Rock-Rose tribe (*Cistaceæ*) may be grown with success on rock-work. Several of the hardier species of the natural order *Mesembryaceæ* will bear exposure; and as they require little nutriment and soil are well adapted for growth on rock-work. Many of the species also of the order *Crassulaceæ* will grow under the same circumstances. Many of the *Cruciferous* plants are naturally rock-plants. Of the *Labiate* plants, the species and varieties of the Thyme claim the first place. Many of the species of the order *Caryophylleæ* may be grown. Many of the *Saxifrages* are true rock-plants: they mostly blossom early in the year. Many of the *Campanulas* may also be grown successfully.

ROCKET, a cylindrical vessel or case, of pasteboard or iron, attached to one end of a light rod of wood, and containing a composition which, being fired, the vessel and rod are projected through the air by a force arising from the combustion.

Rockets have long been used as a means of making signals for the purpose of communication when the parties have been invisible from distance or darkness; and they have occasionally served the important purpose of determining the difference of longitude between two places. Rockets have also been constructed for the purpose of being used in warfare, and such missiles were so employed for the first time at the siege of Copenhagen in 1807.

Signal rockets are made to weigh half a pound, one pound, or two pounds; and the one pound rocket is about 16 inches long. The rod is generally attached near the base, on one side of the rocket, and its length is about 8 feet. The composition with which the cylinder is filled con-

sists generally of saltpetre, sulphur, and charcoal or gunpowder, and the composition which produces what are called the stars, consists of saltpetre, sulphur, antimony, mealed powder, and isinglass. The latter is dissolved in one quart of vinegar, after which one pint of spirit of wine is added, and then the mealed composition is mixed with the liquid till the whole becomes like a stiff paste.

The burning composition acting at the head, and at the opposite end of the rocket, produces impulsive forces in opposite directions; but sundry perforations at the lower extremity, by allowing the fire to escape there, nearly destroys the pressure against the lower end; and thus the pressure at the head is almost wholly effective in giving a forward motion to the rocket. The rod serves to guide it in its flight, the resistance of the air perpendicularly to its length checking any vibrations which may be caused by inequalities in the action of the burning composition.

Rockets whose diameters vary from 1 to 2 inches, have been found to ascend vertically to the height of about 500 yards, and those whose diameters vary from 2 to 3 inches have ascended to the height of 1200 yards. The distances at which rockets can be seen vary from 35 to 40 miles; and the times of ascent, from 7 to 10 seconds. (Robins's 'Tracts,' vol. ii.)

Rockets, to be employed as military projectiles, were invented by Sir William Congreve, and, in the British artillery service, a body of men, called the Rocket Troop, has been organised expressly for their management. From their form they penetrate to a considerable depth when fired against timber or earth: 12-pounder rockets, after a range of 1260 yards, have been found to enter the ground obliquely as far as 22 feet. The principal inconvenience attending the rocket practice is the powerful action of the wind when it blows in a direction perpendicular, and even oblique, to the intended line of flight.

ROCKINGHAM, CHARLES WATSON WENTWORTH, MARQUESS OF, the only son of the first Marquess of Rockingham, was born 13th May, 1730.

Before the end of 1750 his father's death called him to the House of Lords, where, young and inexperienced as he was, he plunged at once into politics. His wealth and position gave him great influence; but he was never distinguished for superior ability; and his consistency to Whiggism was perhaps partly owing to that very narrowness of understanding which prevented him from having any doubt of the truth of the political notions which he had originally adopted. In February, 1760, he was made a Knight of the Garter. His political career from this date forms part of the history of his country. [GEORGE III.; BURKE; PITT.] He was first lord of the treasury and prime minister from 10th July, 1765, to 12th July, 1766, and was again placed at the head of affairs with the same office on the resignation of Lord North, in March, 1782, but died the first of July of that year.

ROCKS. Geologists have attempted to classify and designate rocks on one or other of the following principles:—

1. To assign to a series of rocks in which several mineral types (as sandstone, limestone, argillaceous beds) occur, and which therefore cannot be well described by a mineralogical term, a name depending on locality. Hence the Silurian System, the Devonian System, &c.

2. To give to such a series a title derived from its most characteristic member; as the Cretaceous Group, the Oolitic System, the New Red-Sandstone Series, the Granitic Formation.

3. To avoid all such specially characteristic names, and to substitute terms expressive merely of relative place in the supposed or established series of geological events. Hence Mr. Conybeare's method of Superior, Supramedial, Medial, Submedial, and Inferior Orders of strata.

4. A view almost equivalent in practice, and founded mainly on the same basis, but distinctly involving an important inference regarding the lapse of time, gives us such terms as Primary Strata, Transition Rocks, Secondary Series, Tertiary Formations; and, as a subdivision of these latter, Eocene, Meiocene, Pleiocene Deposits.

Systematic views of rocks, considered as mineral aggregates without any reference to their geological history, have been seldom completed. M. Brongniart has presented a classification of 'mixed rocks' nearly conformed to this principle, which has been of service. Dr. MacCulloch's 'Treatise on Rocks' is a mixed method, mineralogical in detail, geological in the large features.

The most prevalent classification of rocks in actual use is founded on one leading feature of their origin and history. Rocks are of igneous origin (pyrogenous rocks), or of aqueous origin (hydrogenous rocks), and thus make two great classes: the former being often considered, with reference to the circumstances of their occurrence in two divisions, viz. hypogene or Plutonic rocks (as granite), and volcanic rocks (as obsidian); the latter being distinguished into freshwater and marine deposits, the result of chemical, vital, and mechanical agencies exerted in water.

Adopting as the best and most applicable the fundamental distinction of pyrogenous and hydrogenous rocks, the only good way of describing and recognising rocks, is by attention to their elementary composition. The granitic, porphyritic, amygdaloidal, or other structures of igneous rocks, are so many variable circumstances due to particular accidents in the fusion or cooling of the masses, and belong more or less to all of them, as the compact, oolitic, arenaceous, and other characteristic textures of hydrogenous rocks mark peculiarities of their aggregation or solidification. The pyrogenous rocks may in general be usefully classed according to the relative quantities of felspar and augite contained in them; while the hydrogenous rocks of most importance may be classed according to their arenaceous, argillaceous, calcareous, or other basis. All these hydrogenous rocks are liable to local changes, by contact or proximity with the rocks of fusion. These metamorphic rocks may be classed according to the same form as those which are unaltered.

The circumstances which accompany the appearance of pyrogenous rocks will often lead us to probable views as to the conditions under which they were fused and cooled; while, by attention to the texture and structure of the rocks deposited by water, we find marks of sedimentary accumulation in sandstones and clays, and proofs of chemical precipitation or vital arrangement in limestones.

ROCKY MOUNTAINS, or *Chippewyan Mountains*, occupy the central parts of North America, much nearer to the Pacific than to the Atlantic. They may be divided into three parts—the Southern, Central, and Northern Chippewyan Mountains. The first extends from 29° to 42° N. lat.; the Central Chippewyans from 42° to 49° N. lat.; and the Northern from 49° to nearly 70° N. lat. The whole length, from 29° to 70° N. lat., exceeds 3000 miles.

The *Southern Chippewyans* resemble the Northern Andes in being divided into three long ranges, which run off in diverging lines. The point from which they diverge is a mountain-knot, about 42° N. lat., and is called Sierra Verde. From this point the three ranges run southward. From 34° to 42° N. lat. the range has a breadth varying from 50 to 100 miles. The mountains rise abruptly from the plains to the east of them, towering into peaks of great height, which are visible at the distance of more than 100 miles east of their base. They consist of ridges, knobs, and peaks, variously disposed, among which there are many wide and fertile valleys. James Peak is 11,000 feet above the sea level, and some of the peaks are supposed to be still higher; the tops are covered with perpetual snow. The western declivity of the range is less abrupt than that of the eastern. The countries on either side of this range and the intervening valleys are little known; but the overland journeys to California are extending the knowledge of the whole region.

The *Central Chippewyans* between the Sierra Verde, 42° N. lat. and 49° N. lat., have been often crossed by American travellers in passing from the United States to Oregon. In this part the mountain region seems to contain two ranges of great elevation, running parallel to one another at the distance of 100 miles, and enclosing high valleys, which are generally filled up by the rocky masses, which protrude from the great chains to a considerable distance within the valleys. The two chains however do not subside either on the east or on the west into plains, being separated from the level ground, which only occurs at a great distance from them, by hilly regions of considerable extent. Not far from the Sierra Verde is a pass sufficiently low for vehicles to traverse it; and the eastern chain is furrowed by many deep and narrow valleys, extending among the mountains, which in some places attain a height of 15,000 feet. The western chain, which is somewhat lower, appears to be of greater width. The middle of this range, which is called the Blue Mountains towards its northern extremity, is in some parts covered with dense and gloomy forests, and cut up by deep and precipitous ravines; but along its western side there is a hilly region in which several wide depressions occur, most of which are well watered, and are prairie lands. Two easy passes cross the western chain about 46° or 47°; but the approach to them from the east chain is exceedingly rugged and difficult. In this region originate the numerous rivers by whose confluence the river Missouri is formed, besides its first great confluent the Yellow Stone River, which receives the waters of the Big Horn River. It is between 45° and 47° that travellers usually cross the mountains on the way from Missouri to Oregon. Most of the country between the Central Chippewyans and the Pacific is very hilly and rugged.

The *Northern Chippewyans* extend from 49° N. lat. to the mouth of the river Mackenzie, a distance of more than 1500 miles. Their direction is nearly due north-west. The southern portion, between 49° and 55° N. lat., seems to be the highest part of the whole range. Most of the summits are covered with snow all the year round. Mount Hooper is 15,690 feet, and Mount Brown nearly 16,000 feet high. These two summits are between 62° and 53° N. lat. On their eastern declivities rise the northern fork of the Saskatchevan and the river Athabasca, and from the western descend the rivers that form the two principal branches of the Columbia River. These two branches flow northward and southward in a deep and narrow valley, which extends above 300 miles along the western base of the mountains. To the west of this valley rises the western chain of the Chippewyan Mountains: it is very little known, except as to its general direction and its elevation, which is much inferior to that of the eastern range. The fur-hunters are acquainted with two passes over the mountains above 53°; and there is another at about 57°, where the Peace River breaks through the eastern chain. The western range, which is about 200 miles from the Pacific, constitutes the watershed between the rivers which run east to the Atlantic and west to the Pacific. North of 52° or 53° N. lat. the forests that cover the declivities of the Chippewyan Mountains are very extensive, and the trees themselves are large and of very vigorous growth. From 57° to 62° the mountains sink in altitude, but spread out to a much greater width, dividing into three or four parallel ridges. Between 62° and 69° N. lat. the eastern range of the Chippewyan Mountains approaches the valley of the Mackenzie River, and within these limits they were seen by Franklin on his second expedition to the Polar Sea. They form a great number of parallel and diverging ridges, with few peaks exceeding 2000 feet in height.

The mountains which spread over nearly the whole surface of Russian America, and which consist of many parallel ranges, may be considered as the northern or north-western extremity of the Chippewyans.

Little is known respecting the minerals of this range. Some traces of iron and lead have been observed. Rock-salt exists in several places, especially in the Southern Chippewyans, where several rivulets occur, whose water is salt or brackish. Coal has been found in several places

in the Northern Chippewyans, especially in the southern portion, near the Saskatchevan and Peace River, and also towards the mouth of the Mackenzie River. But the most important discovery has been that of the gold region near the western offshoots of that portion of the Chippewyans which bounds California.

ROCROY. [ARDENNES.]

RODENTIA, *Rongeurs* (*Glires*, Linn.), the name of Cuvier's fifth family of Mammalia. The dentition of these animals is peculiar:—two large incisor teeth in each jaw are separated from the molars by a wide space. These incisors, as Cuvier remarks, are unfitted for the effective seizure of living prey, or for rending flesh; neither are they adapted for cutting food, but they are available for reducing substances by continual labour into fine particles, in a word for gnawing them; whence the term *Rodents*, or *Gnawers*, applied to this order. With these weapons they attack the hardest vegetable productions, and frequently feed on wood and bark. The better to effect this object, these incisors have enamel in front only, so that their posterior border being worn away more than their anterior edge, they are always kept set like a chisel; their prismatic form causes them to grow from the root in proportion to the wearing down of their cutting edge, and this disposition to grow or push forward from the root is so strong, that if one of them is lost or broken, its antagonist, meeting with no opposition to keep it within bounds, develops itself so as to become monstrous. The lower jaw is articulated by a longitudinal condyle, so as to have no horizontal movement except from behind forwards, and vice versâ, convenient for the action of gnawing; the molars consequently have flat crowns, the enamelled eminences of which are always transversal, so as to be in opposition to the horizontal movements of the jaw, and to be better adapted for trituration.

The genera in which these eminences are simple lines, and which have the crown of the tooth very flat, are more exclusively frugiverous; those which have the eminences divided into blunt tubercles are omnivorous; and, finally, the small number of those which have points, more willingly attack other animals, and approximate a little to the *Carnivora*.

The form of the body of the Rodents is in general such that their hinder parts exceed their anterior ones, so that they leap rather than walk; this disposition in some of them is as excessive as in the kangaroos.

The intestines of the animals of this order are very long; their stomach simple or slightly divided, and their cæcum often very voluminous, even more so than the stomach. The *Myoxi* (Dormice) want the cæcum.

The brain of the Rodents is nearly smooth and without convolutions; the orbits are not separated from the temporal fossæ, which have but little depth; the eyes are entirely directed laterally; the zygomatic arches, delicate and curved below, announce the weakness of the jaws; the forearms have scarcely any rotatory motion, and their two bones are nearly united; in a word, the inferiority of these animals shows itself in the greater part of the details of their organisation. Nevertheless, the genera which have the strongest clavicles enjoy a certain dexterity, and use their fore-feet for carrying their food to their mouth: others again (the Squirrels) climb trees with facility. ('Règne Animal.')

An arrangement of the families of the present order involves many difficulties. Accordingly various naturalists have proposed very different methods, guided by such characters as have appeared to them respectively of leading importance. For Cuvier's arrangement see the 'Règne Animal.'

In the tenth volume of the 'Annals of Philosophy,' Mr. Gray gives an arrangement of the *Rodentia*, or *Glires*, dividing them into five families, viz. *Muridæ*, *Hystricidæ*, *Leporidæ*, *Jerboidæ*, and *Aspalcidæ*. Mr. Swainson ('Classification of Quadrupeds') divides this order into two chief sections: 1, those with clavicles; 2, those with rudimentary clavicles or no clavicles.

In the 'Magazine of Natural History,' new series (1839), will be found Mr. Waterhouse's interesting 'Observations on the *Rodentia*, with a View to point out the Groups as indicated by the Structure of the Crania in this Order of Mammals.' And in November, 1839, the same accurate observer laid before a meeting of the Zoological Society of London a tabular view of the distribution of this numerous order.

We may here also refer to the 'Natural History of Mammalia' by Mr. Waterhouse, London, 1846-7. [AGOUTI; BEAVER; MURIDÆ; LEPORIDÆ: PORCUPINES.]

Fossil Rodentia.—Fossil Rodentia are abundant in the tertiary deposits and in various caverns, often in prodigious quantities; as, for example, in some of the caves in Brazil, as noticed by Dr. Lund in his view of the Fauna of Brazil previous to the last geological revolution.

RODERIC, the thirty-fourth and last of the Visigothic line of kings who filled the throne of Spain from 411 to 711. He appears to have been the son of Theodofred, duke of Cordova. Having been entrusted by Witiza with the command of the army, Roderic revolted against his sovereign in 708, deprived him of the crown, and banished him to Toledo. The sons of Witiza crossed over to Africa, where they were kindly received by Ilyan (the Count Don Julian of the Spanish chronicles), lord of Ceuta and Tangiers, who offered, if assisted by the Arabs, to restore the princes to the dominions of their father. He communicated his project to Músa Ibn Nosseyr, then governor of Africa for the Khalifs of Damascus [MUSA; MOORS], and the invasion and conquest of Spain was the consequence. Roderic is generally believed to have been killed in the great battle which was fought near Medina Sidonia, July 26, 711. His reign had lasted nearly three years. There are various fabulous chronicles of this king, which have furnished ample materials for poetical fiction.

RODEZ, or RHODEZ. [AVEYRON.]

RODNEY, GEORGE BRYDGES, ADMIRAL, LORD, was born at Walton-upon-Thames, in Surrey, Feb. 19, 1718. He was taken from

Harrow School, and sent to sea at twelve years of age. In 1739 he was made a lieutenant; in 1742, a captain; and in 1748 he was sent out as governor and commander-in-chief on the Newfoundland station, with the rank of commodore. He was raised to the rank of rear-admiral, May 19, 1759.

In 1761 Admiral Rodney was appointed commander-in-chief at Barbadoes and the Leeward Islands. Having captured the islands of Martinique, Santa Lucia, and Granada, he was recalled on the conclusion of peace in 1763. Soon after his return he was created a baronet, and made vice-admiral of the red. He was sent out in 1771 as commander-in-chief on the Jamaica station. In 1774 he was recalled. In May, 1778, he was made admiral of the white, and in the autumn of 1779 was again appointed commander-in-chief on the Barbadoes station, for which he sailed Dec. 29, 1779. His fleet consisted of 22 sail of the line and 8 frigates. Before he had been ten days at sea he had captured seven Spanish ships of war, and on Jan. 16, 1780, fell in with a Spanish fleet, under Admiral Langara, near Cape St. Vincent, consisting of 11 ships of the line, and 2 frigates. Of these five were taken and two destroyed.

On April 17, 1780, Rodney came in sight of the French fleet under the Comte de Guichen, near Martinique; only five or six ships supported him, while in his own, the Sandwich, he engaged a 74 and two 80-gun ships for an hour and a half, and compelled them to bear away, and broke through the enemy's line. The admiral was rewarded with the thanks of the House of Commons, and a pension of 2000*l.* a year. In 1780 he was chosen to represent the city of Westminster, and was also made a Knight of the Bath. Soon afterwards war was declared against the states of Holland, and instructions were sent to Rodney to attack their possessions in the West Indies. The Dutch island of St. Eustatius surrendered Feb. 3, 1781; and in the course of the spring, the Dutch colonies of Demerara, Essequibo, and Berbice, were taken. Rodney, having returned to Europe in the autumn of 1781, was received with universal enthusiasm, was created vice-admiral of England, and was appointed to the command of the whole of the West Indies. Both the French and Spanish fleets were at this time in the West Indies, and it was intended to form a junction, and attack Jamaica and the other British possessions. The French fleet was commanded by the Comte de Grasse, and consisted of about 30 ships of the line, besides frigates. The British fleet was rather more in number, but much less in weight of metal. Intelligence having been brought to Rodney, April 8, 1782, of the French fleet having sailed from Fort Royal Bay, Martinique, he immediately followed them. A partial action took place on the 9th, when two of the French ships of the line were disabled, and a third was rendered useless by an accident in the night of the 11th. The general action commenced on April 12, 1782, at seven o'clock in the morning, and lasted till half-past six in the evening. Rodney, in the Formidable, broke through the French line, engaged the Ville-de-Paris, De Grasse's flag-ship, and compelled her to strike. The result was, that seven ships of the line and two frigates were taken by the British. Rodney reached England Sept. 21, 1782, and was raised to the peerage with the title of Baron Rodney, with an additional pension of 2000*l.* a year. He chiefly lived in the country, till May 23, 1792, when he died. A monument was erected to his memory in St. Paul's Cathedral, London, at the national expense.

RODRIGUEZ, VENTURA, was born at Cienpozuelos, in Spain, July 14, 1717, and commenced his studies in architecture under Esteban Marchand, who was then employed on the works carrying on at Aranjuez. In 1747 he was made honorary member of the Academy of St. Luke at Rome; and on that of St. Fernando being established at Madrid, in 1752, he was appointed professor of architecture. He was employed on various cathedrals, churches, colleges, hospitals, and other structures at Zaragoza, Malaga, Toledo, Granada, Valladolid, and other places. Of his numerous works, we can here merely point out, as being among the more remarkable for their design, the sanctuary at Cobadonga, the church of San Felipe Neri at Malaga, that of the hospital at Oviedo, and the palace of the Duque de Liria at Madrid. He died at Madrid, 1785, and was buried in the church of San Marcos, erected by himself.

ROEBUCK. [Deer.]

ROEBUCK, JOHN, M.D., the son of a Sheffield manufacturer, was born in 1718, was educated at Northampton under Dr. Doddridge, and subsequently in the university of Leyden, and settled in Birmingham as a physician. He introduced some improvements in the processes of refining gold and silver, and established, in connection with Mr. Samuel Garbet, a refinery and chemical manufactory at Birmingham. He also effected great improvements in the manufacture of sulphuric acid, and, in conjunction with Garbet, he established, in 1749, vitriol-works at Preston-Pans in Scotland. Abandoning his medical practice, Roebuck henceforward resided chiefly in Scotland, where he improved the methods of smelting and manufacturing iron with pit-coal instead of charcoal, and founded the great iron-works at Carron, for which he chiefly designed the furnaces and machinery, calling in the aid of Smeaton, and subsequently of Watt. The first furnace at this great establishment, the formation of which constitutes an æra in the history of British manufactures, was blown Jan. 1, 1760. Unfortunately for himself Roebuck became the lessee of extensive coal and salt-works at Borrowstounness, belonging to the Duke of Hamilton, by which he became greatly involved. He died July 17, 1794. In a copious memoir in the fourth volume of the 'Transactions of the Royal Society of Edinburgh,' of which he was a fellow, he is stated to have been the author of a few papers read before that and the Royal Society of London, and to have published two political pamphlets.

ROE'LAS, JUAN DE LAS, commonly known

as *El Clerigo Roelas*, was born at Seville, about the year 1560. Roelas is supposed to have studied under some of the scholars of Titian in Venice. In 1603 he painted four pictures for the college of Olivares. From 1607 until 1624, he lived chiefly at Seville and Madrid. He settled in Olivares in 1624, when he was appointed one of the canons of the college, and he died there April 23, 1625.

The works of Roelas are very numerous in Seville; and there are still many in the college of Olivares, and some at Madrid. His masterpiece is the death or 'el Transito' of San Isidoro, in the church of that saint at Seville. Roelas is compared with Tintoretto and the Carracci. He is the best of the Andalucian painters in design and composition, and displays frequently a grandeur of form and majesty of character which belong only to the greatest masters.

ROEMERIA, a genus of plants belonging to the natural order *Papaveraceæ*. The species are annual herbs yielding a yellow juice, with violet flowers. *R. hybrida*, Hybrid Roemeria, is a native of Europe and the north of Africa, in cultivated fields and vineyards, especially on the coasts of the Mediterranean. Two other species, *R. refracta* and *R. bivalvis*, have been described, the first a native of Tauria, the second of Syria.

ROERMONDE. [Limburg.]

ROGATION DAYS. It was a general custom formerly, says Bourne, and it is still observed in many parishes, to go round the bounds and limits of the parish on one of the three days preceding Holy Thursday. Spelman considers this custom as an imitation of the Roman Terminalia. The primitive custom used by Christians on this occasion was, for the people to accompany the bishop or some of the clergy into the fields, where Litanies were recited, and the mercy of God implored, that he would avert the evils of plague and pestilence, that he would send them good and seasonable weather, and give them in due season the fruits of the earth. The Litanies or Rogations then used gave the name of Rogation Week to this time. They occur as early as A.D. 550.

ROGUE and VAGABOND. [Vagrant.]

ROHILCUND. [Hindustan, vii., 210.]

ROLAND, MADAME. *Manon-Jeanne Phlipon* was born in Paris in 1756. Her father was an artist; her mother was a woman of superior understanding and of amiable temper. Manon in her father's house enjoyed to a certain extent the means of cultivating painting, music, and general literature. At an early age her religious enthusiasm was extreme; in after years it subsided, and her opinions, she confesses, went through every change until they rested in scepticism. Her reading, under her father's roof, was of a most miscellaneous description; her favourite author was Plutarch, who however eventually gave place to Rousseau.

At the age of five and twenty she became the wife of M. Roland, who held the office of Inspector of Manufactures. Her husband was twenty years her senior, of laborious habits, considerable acquirements, and severe manners. A daughter was the fruit of this marriage, and Madame Roland's time became divided between the care of her child's education, and giving assistance to her husband. With him Madame Roland visited England, Switzerland, and other countries of Europe—everywhere inquiring into the nature of the civil institutions, and manifesting the warmest sympathy with the advocates of political liberty. The interest with which such a woman regarded the first movements of liberty in her own country may easily be conceived. During the ministry of the party of the Gironde, Roland was appointed minister of the interiôr. The talents of his wife were at this time applied to assist him in the composition of public papers, and the famous letter of M. Roland to Louis XVI. (May, 1792) was drawn up by her. This production occasioned M. Roland's dismissal by the court; for which he was compensated by the warm applauses of the Convention. He again became a minister after the events of the 10th of August; but his party had then passed the bounds prescribed by his judgment, and entered upon extremes repugnant to his high-minded and generous wife.

The events of the reign of terror do not require to be detailed. The frightful massacres in the prisons of Paris on the 2nd and 3rd of September, were feebly denounced by Roland in his capacity as minister; but from that hour his own doom and that of his wife became only more certain. Madame Roland had herself been already arraigned before the Convention on an absurd charge of treasonable correspondence with England; and by her presence of mind, her acuteness, and her wit, had baffled and mortified her accusers. She and her husband soon began to receive warnings of their danger. He deemed it prudent to quit Paris—a course which his wife disdained; and on May 31, 1793, she was arrested, and thrown into the prison of the Abbaye. Her place of confinement was soon after changed to Sainte Pelagie, where she was shut up with the most degraded of her sex. The wretchedness of her situation at Sainte Pelagie was only alleviated by her literary occupations, and by the kindness of her gaolers, whom her fascinating manners and behaviour converted into friends. She here devoted all her time to the composition of her 'Memoirs,' writings full of lively description, entertaining anecdotes of her contemporaries, and many acute remarks. They contain also some passages hardly reconcileable with the modesty of a woman. Some persons have expressed a doubt about the genuineness of these Memoirs. In the shape in which we now have them they are not a moral book. A letter to her daughter, written in these circumstances, is one of the most affecting of farewells.

It was in October, 1793, that the Girondists were destroyed. On the 31st of that month she was sent to the Conciergerie. On the 8th of November she appeared before the Revolutionary Tribunal. She had declined the proffered aid of M. Chauveau-Lagarde, the great advocate of the Girondists. Part of the previous night was occupied by her in writing her eloquent defence. Her courage did not desert her during her trial or at her execution. To the last moment she preserved her presence of mind, and even her gaiety. It

is said that bending herself before the statue of Liberty, close to the scene of death, she exclaimed, 'Oh! Liberty! what crimes are committed in thy name!' Her husband stabbed himself a week afterwards, on hearing of her death.

ROLLER, *Coracias*, a small genus of insectorial birds placed by Vigors among the *Corvidæ* [CORVIDÆ], by C. L. Bonaparte among the *Ampelidæ* [BOMBYCILLA], and by Swainson, Yarrell, and others, among the *Meropidæ* [MEROPIDÆ].

The Roller (*Coracias garrula*, Linn.) is one of the most beautiful of European birds; its head, neck, and breast presenting various shades of verditer blue changing to pale green; the shoulders are azure blue. Length, 13 inches.

Roller (*Coracias garrula*).

The Roller is the *Pica marina* and *Pica merdaria* of the Italians; *Rollier* of the French; *Birk-Heher*, *Blaue-Racke*, and *Mandelkrahe* of the Germans.

Geographical Distribution.—This bird appears to have a wide range. In Europe, it is found in Denmark, Sweden (where it arrives with the Cuckoo), and the southern provinces of Russia; is more common in Germany than France, where however it has been found in Provence; and it has been taken at Gibraltar. In Italy, according to Prince C. L. Bonaparte, it is rather common, arriving in the spring and departing in September. In Malta and Sicily it is exposed for sale in the shops of poulterers, and is said to have the taste of a turtle-dove. In the Morea it is considered a delicacy in the autumn, when it is fat with its summer food. It has been captured at Aleppo, and at Trebizond and Erzeroum. It visits the countries between the Black Sea and the Caspian Sea; and Dr. Van Siebold and M. Bürger include it among the birds of Japan. In North Africa it is found from Marocco to Egypt; flocks were seen by Adanson at Senegal, and he concluded that they passed the winter there. Dr. Andrew Smith records it among the birds of South Africa. In Great Britain it has been killed in Cornwall, in Suffolk and Norfolk, in Cambridgeshire, in Yorkshire, Northumberland, Perthshire, the east of Scotland, and the Orkneys.

Habits, Food, &c.—Deep forests of oak and birch appear to be the favourite haunts of the Roller. In the 'Annals of Natural History' for 1839, it is stated by a traveller in Asia Minor, that the Roller, which was most common throughout the south and west parts of the country wherever the magpie was not found (for it was not seen in the same district with that bird), was observed to fall through the air like a Tumbler Pigeon. Temminck states that it makes its nest in the holes of trees, where it lays from four to seven eggs of a lustrous white. M. Viellot states that in Malta, where trees are scarce, the bird builds on the ground. In Barbary it has been observed to form its nest in the banks of rivers; and Pennant remarks that where trees are wanting, it makes its nest in clayey banks. These last modes of nidification bring it very close to the Bee-Eaters and Kingfishers, whose eggs resemble those of the Roller in colour and shape, and only vary in size. The male takes his turn to sit. The food is very varied, according to Temminck, who enumerates moles, crickets, cockchafers, grasshoppers, millipedes, and other insects, slugs and worms. Gould states that it feeds on worms, slugs, and insects generally. Yarrell informs us that the food consists of worms, slugs, insects in their various stages, and berries.

By Lesson, the Mino-Birds (*Eulabes*, Cuvier) are placed next to the Rollers in his family *Eurystomidæ*. Mr. Swainson arranges it under the family *Sturnidæ*; and Mr. G. R. Gray under the *Corvidæ* in the subfamily *Graculinæ*.

The type of Cuvier's genus *Eulabes* is the Javanese Mino-Bird (*Eulabes Javanus*, Viell.; *Gracula religiosa*, Linn.). This bird is a native of Java, Sumatra, and the great Eastern Islands. It is of a deep velvety black; a white space on the middle of the wing; bill and feet yellow; behind the eye spring fleshy carbuncles of a bright orange red, extending beyond the occiput.

Insects and fruits form the food of the Mino-Bird, which is easily tamed, and learns to whistle and talk with great facility. With the natives it is a great favourite in consequence. Marsden says of it, that it has the faculty of imitating human speech in greater perfection than any other of the feathered tribe.

The general opinion seems to be that there is but one species of Mino-Bird. Cuvier however states that Linnæus confounded two species under the name of *Gracula religiosa*, viz. *Eulabes Indicus* and *Eulabes Javanus*.

M. Lesson, who states that only one species is known, viz. the *Mainate Religieux*, *Gracula religiosa*, Linn., remarks afterwards that there is said to be a smaller variety: this is probably the *Eulabes Indicus*.

ROLLIN, CHARLES, born at Paris, Jan. 30, 1661, was the son of a master cutler, and was intended for the same trade. Attracting the notice of a Benedictine monk, he was placed at the college of Plessis. Here he pursued his studies with great zeal, and afterwards devoted three years to the study of theology at the Sorbonne. In 1687, he was made professor of Rhetoric at the College of Plessis; and the next year professor of eloquence in the Royal College. In 1694 he was appointed rector of the university of Paris, in which office he continued two years, and having at the end of that time resigned all his public employments, he was engaged by Cardinal

Noailles to superintend the studies of his nephews. Shortly afterwards he was persuaded to become coadjutor in the college of Beauvais. In this situation he passed fifteen years, devoting himself to the improvement of the system of education, a course which he had previously pursued at Plessis. In consequence of the disputes between the Jesuits and the Jansenists, which latter party he was thought to favour, Rollin was compelled to quit his office at Beauvais. In 1715 he published his edition of Quintilian, in two volumes, 12mo. In 1720 he was again chosen rector of the university of Paris, but in consequence of the religious feuds he was displaced very shortly. From this period till his death he seems to have devoted himself to study. In 1726 appeared his 'Traité de la Manière d'Étudier et d'Enseigner les Belles-Lettres.' Encouraged by the general approbation with which this publication was received, Rollin composed his 'Histoire Ancienne,' 1730–8, 13 vols. 8vo. His last work was a history of Rome, which was afterwards continued by Crevier. He died Sept. 14, 1741.

Rollin's 'Opuscules' were collected and published, 2 vols. 12mo, in 1771. He also wrote a 'History of the Arts and Sciences of the Ancients,' London, 1768, 3 vols. 8vo. His 'Histoire Ancienne' has been translated into English, and often reprinted.

ROLLO. [NORMANDIE.]

ROLLS, MASTER OF THE. [CHANCERY.]

ROMA, COMARCA DI, a province of the Papal state, in which the city of Rome is situated, and which is under the same administrative authorities as the metropolis itself. It consists of the Agro Romano, or territory immediately around Rome, and of the districts of Tivoli, Albano, and Subiaco. It is bounded N. by Spoleto-e-Rieti, E. by the kingdom of Naples, S. by the province of Frosinone, S.W. by the Mediterranean, and W. by the province of Viterbo. [CAMPAGNA DI ROMA.]

ROMAGNA, a name which was given in the middle ages to a tract of country N. of the Apennines, extending along the coast of the Adriatic, from the Foglia near Pesaro, to the Scoltenna, or Panaro, which partly separates the Bolognese from Modena. This extent of territory corresponds to that of the modern Papal legations, Bologna, Ravenna, Ferrara, and Forli. The Po was its boundary on the north, and the Apennines of Tuscany on the south and west. Ravenna was the chief town. The name of Romagna, or Romandiola, is said to have been given to it in consequence of the Exarchs having fixed their residence at Ravenna, which thereby became a second Rome, being the seat of the Imperial government in Italy. Julius II. annexed the Romagna to the Papal States. After the division of the country into legations, the term Romagna continued in use, being applied more especially to the eastern part of the country, near the Adriatic, between Rimini and Ravenna, the inhabitants of which are called at Rome to this day Romagnoli. The people of Bologna and Ferrara are not understood as included in this denomination.

ROMAGNO'SI, GIAN DOME'NICO, born near Piacenza in 1761, studied first in the College Alberoni, and took his degree of Doctor of Law at Parma, in 1786. He afterwards practised as an advocate. In 1791 he published his 'Genesi del Diritto Penale,' being an investigation of the grounds on which the infliction of punishment for offences is founded. Soon after the publication of the work, the prince bishop of Trent named him prætor, or chief magistrate, which office he held three consecutive years, after which the bishop named him his aulic councillor.

During the turmoil of the French revolution, Romagnosi did not participate in the blind admiration of many of his countrymen for what were called the new ideas, and he tried to define the just meaning of liberty and equality in two little works, 'Che Cosa è Eguaglianza,' 'Che Cosa è Libertà,' 1793. When the French entered the Tyrol, Romagnosi was named secretary of the provisional council instituted at Trent, in which capacity he did all he could to alleviate the evils of foreign invasion. In December, 1802, he was appointed professor of law in the university of Parma, where he published his second professional work, 'Introduzione allo Studio dell Diritto Pubblico Universale.' In 1806 Romagnosi was requested by the government of Italy, then under Napoleon, to repair to Milan, in order to assist other distinguished jurists in compiling a code of criminal procedure. Romagnosi had considerable difficulty in preventing the introduction into Italy of Lettres de Cachet; but he carried his point, and would have introduced trial by jury if Bonaparte had not refused to assent to it. The code was adopted, and published under the following title, 'Codice di Procedura Penale del Regno d'Italia,' 8vo., Brescia, 1807. The suggestions of Romagnosi were published separately under the title 'Ultime e più necessarie Aggiunte e Riforme al Progetto del Codice di Procedura Penale,' Milano, 1806. Romagnosi was likewise employed in the compilation of a penal code for the kingdom of Italy, which however never became law.

In 1807 Romagnosi was appointed professor of civil law in the university of Pavia, and in 1809 he was recalled to Milan to lecture on legislative science, in order to form a kind of academy of advocates and magistrates. As part of his scheme, he published his 'Discorso sul Soggetto ed Importanza dello Studio dell' Alta Legislazione,' Milan, 1812; and also 'Principii fondamentali di Diritto Amministrativo,' 1814. From his lectures he compiled, in 1820, his 'Assunto Primo della Scienza del Diritto Naturale.' His 'Saggio Filosofico-Politico sull' Istruzione Pubblica Legale,' Milan, 1807, belongs to this period. He had previously written a 'Progetto di Regolamento degli Studj Politici Legali.' He also edited a 'Journal of Civil and Administrative Jurisprudence.'

When Napoleon's power was overthrown in 1814, Romagnosi lost his offices, but he continued to lecture on jurisprudence till September, 1817, when the special chairs at Milan were suppressed. In June, 1821, he was summoned to Venice to be tried on a charge of high treason, of which however he was fully acquitted in December of the same year. He still continued to live at Milan,

teaching, and writing for several journals, and especially for the 'Annali di Statistica.' His work entitled 'Dell' Indole e dei Fattori dell' Incivilimento con Esempio del suo Risorgimento in Italia' had the merit of rendering previous inquiries as well as his own, on the progress of civilization, familiar to the Italian readers.

The other principal works of Romagnosi are:—1, 'Che Cos' è la Mente Sana?' Milan, 1827; 2, 'Della Suprema Economia dell' Umano Sapere in relazione alla Mente Sana,' Milan, 1828; 3, 'Dell' Insignamento Primitivo delle Matematiche; 4, 'L'Antica Morale Filosofia; 5, 'Elogio Storico di Melchiorre Gioia;' 6, 'Elogio del Cardinale Alberoni;' 7, 'Note, Supplementi, ed Illustrazioni all' India Antica di Robertson.' He left several works in MS.

Romagnosi died at Milan, in June, 1835. His funeral was attended by more than two hundred of the most distinguished men of that capital.

ROMAINE, WILLIAM, was born at Hartlepool, in Durham, Sept. 25, 1714. His father was one of the French Protestants who fled to England upon the revocation of the Edict of Nantes. He was educated at the grammar-school of Houghton-le-Spring, whence he proceeded to Oxford in 1730 or 1731, and entered first at Hertford College, and afterwards at Christ Church. He resided principally at Oxford, devoting himself especially to the study of the Hebrew and Greek Scriptures, till he took his degree of M.A. in 1737. He had received deacon's orders the year before. His first curacy was that of Loe Trenchard, in Devon, which he served for six months; but he soon afterwards held curacies near London. Sir Daniel Lambert, on his election to the mayoralty of London in 1741, appointed Mr. Romaine his chaplain. At the end of that year he returned to an attack which he had previously made upon Warburton's theory regarding the Divine Legation of Moses, in a sermon preached at St. Mary's, Oxford, having in the mean time been engaged in an epistolary controversy with Warburton. The next seven years of his life were devoted to the preparation of a new edition of Calasio's Hebrew Concordance and Lexicon, which was published in 1747. He was chosen lecturer at St. George's, Botolph Lane, and St. Botolph's, Billingsgate, in 1748. In the following year he was elected to two lectureships at St. Dunstan's-in-the-West, one of which he held till his death. In 1750 he was appointed assistant morning preacher at St. George's, Hanover Square. He held this office till September, 1755, when he was removed from it, his biographer tells us, on account of 'the popularity and plainness of his ministry.' In February, 1755, he married Miss Price; and in the following year he became curate and morning preacher at St. Olave's, Southwark, where he remained till 1759.

Romaine had frequently preached before the university of Oxford up to the year 1757, when he was refused the use of the university pulpit, in consequence of the offence which was taken at a sermon he delivered there on 'the Lord our Righteousness.' In 1764 he was chosen to the rectory of St. Andrew by the Wardrobe, and St. Ann's, Blackfriars. His election was disputed, but in 1766 it was confirmed by the Court of Chancery. He spent the rest of his life in London, in the faithful and zealous discharge of the duties of this office. He died July 26, 1795.

Romaine's works, which are numerous, consist of 'A Seasonable Antidote against Popery, in a Dialogue upon Justification,' 1757; 'The Life of Faith,' 1763; 'The Walk of Faith,' 1771; 'The Triumph of Faith,' 1795; and a number of sermons. Romaine's Works were published in 8 vols., in 1796, with a Life by the Hon. and Rev. William Bromley Cadogan, M.A.

ROMAN ARCHITECTURE. [CIVIL ARCHITECTURE.]

ROMAN CATHOLIC CHURCH. Although in ordinary language this name is often used to designate the ruling authority or power in the Roman Catholic religion, as if distinct from the members of that communion, yet the definition which Catholics give of the church is such as to comprehend the entire body of its members as well as its rulers, the flock as much as the shepherds. Thus we hear of Catholics being under the dominion of their church, or obliged to obey it, as though it were something distinct from themselves, or as if they were not a part of their church. This preliminary remark is made to explain a certain vagueness of expression, which often leads to misapprehension, and serves as the basis of incorrect ideas regarding the peculiar doctrines of that church. The Catholic Church therefore is defined to be the community of the faithful united to their lawful pastors, in communion with the see of Rome, or with the Pope, the successor of St. Peter and vicar of Christ on earth.

The government of the Catholic Church may be considered monarchical, inasmuch as the pope is the ruler over the entire church, and the most distant bishop of the Catholic Church holds his appointment from him, and receives from him his authority. No bishop can be considered lawfully consecrated without his approbation. The dignity or office of pope is inherent in the occupant of the see of Rome, because the supremacy over the church is believed to be held in virtue of a commission given to St. Peter, as a part of the constitution of the church, for its advantage, and therefore intended to descend to his successors; as the episcopal power did from the apostles to those who succeeded them in their respective sees.

The election of the pope devolves upon the clergy of Rome, as being their bishop; and it is confided to the college of cardinals, who, bearing the titles of the eldest churches in that city, represent its clergy, and form their chapter or electoral body. The meeting or chapter formed for this purpose alone is called a *Conclave*. The cardinals are appointed by the pope, and compose the executive council of the church. They preside over the various departments of ecclesiastical government, and are divided into boards or congregations, as they are called, for the transaction of business from all parts of the world; but every decision is subject to the pope's revision, and has no value except from his approbation. On some occasions they are all summoned to meet the pope

on affairs of higher importance, as for the nomination of bishops, or the admission of new members into their body; and then the assembly is called a *Consistory*. The full number of cardinals is seventy, but there are always some hats left vacant.

The Catholic Church is governed by bishops, who are of two sorts, bishops in ordinary, and vicars apostolic. By the first are meant titular bishops, or such as bear the name of the see over which they rule; as the Archbishop of Paris, or of Dublin; the Bishop of Cambray, or of New Orleans. The manner of appointing such bishops varies considerably. When they are unshackled by the government, the clergy of the diocese meet in chapter, according to old forms, and having selected three names, forward them to the Holy See, where one is chosen for promotion. This is the case in Ireland and Belgium. In most countries however the election of bishops is regulated by *Concordat*, that is, a special agreement between the pope and the civil government. The presentation is generally vested in the crown; but the appointment must proceed from the pope.

The powers of bishops, and the manner of exercising their authority, are regulated by the canon law; their jurisdiction is clear and definite, and leaves no room for arbitrary enactments or oppressive measures. Yet it is of such a character as, generally considered, can perfectly control the inferior orders of clergy, and secure them to the discharge of their duty. In most Catholic countries there is a certain degree of civil jurisdiction allowed to the bishops, with judicial powers, in matters of a mixed character; as in cases appertaining to marriages, where a distinction between civil and ecclesiastical marriage has not been drawn by the legislature. Some offences connected with religion, as blasphemy or domestic immorality, are likewise brought under their cognizance.

Where the succession of the Catholic hierarchy has been interrupted, as in England, or never been established, the bishops who superintend the Catholic Church and represent the papal authority are known by the name of *Vicars Apostolic*. A vicar apostolic is not necessarily a bishop. Generally however, he receives episcopal consecration; and as, from local circumstances, it is not thought expedient that he should bear the title of the see which he administers, he is appointed with the title of an ancient bishopric now in the hands of infidels, and thus is called a bishop *in partibus infidelium*, though the last word is often omitted in ordinary language. A vicar apostolic, being generally situated where the provisions of the canon law cannot be fully observed, is guided by particular instructions, by precedents and consuetude, to which all the uniformity of discipline through the Catholic church gives stability and security. Thus the vicars apostolic, who rule over the four episcopal districts of England, have their code in the admirable constitution of Pope Benedict XIV., beginning with the words 'Apostolicum Ministerium.' The powers of a vicar apostolic are necessarily more extended than those of ordinary bishops, and are ampler in proportion to the difficulty of keeping up a close communication with Rome. Thus many cases of dispensation in marriage which a continental bishop must send to the Holy See may be provided for by an English or American vicar apostolic; and other similar matters, for which these must consult it, could at once be granted by the ecclesiastical superiors of the Mauritius or of China. The nomination of vicars apostolic is solely with the pope.

The inferior clergy, considered in reference to the government of the church, consists mainly of the parochial clergy, or those who supply their place. In all countries possessing a hierarchy, the country is divided into parishes, each provided with a *Párochus* or *Curate**, who corresponds to the rector or vicar of the English established church. The appointment to a parish is vested in the bishop, who has no power to remove again at will, or for any cause except a canonical offence juridically proved. The right of presentation by lay patrons is however, in particular instances, fully respected. In Italy the parish priests are generally chosen by competition: upon a vacancy, a day is appointed on which the testimonials of the different candidates are compared, and they are examined before the bishop, in theology, the exposition of scripture, and extemporaneous preaching; and whoever is pronounced, by ballot, superior to the rest, is chosen.

Under an apostolic vicariate, the clergy corresponding to the parochial clergy generally bear the title of *Apostolic Missionaries*, and have *Missions*, or local districts, with variable limits placed under their care; but they are dependent upon the will of their ecclesiastical superiors.

Besides the parochial clergy, there is a considerable body of ecclesiastics, who do not enter directly into the governing part of the church, although they help to discharge some of its most important functions. A great number of *Secular Clergy* are devoted to the conduct of education, either in universities or seminaries; many occupy themselves exclusively with the pulpit, others with instructing the poor, or attending charitable institutions. A certain number also fill prebends, or attend to the daily service of cathedrals, &c.; for in the Catholic church pluralities, where the cure of souls exists, are strictly prohibited, and consequently a distinct body of clergy from those engaged in parochial duties, or holding rectories, &c., is necessary for those duties. Besides this auxiliary force, the *Regular Clergy*, or monastic orders, take upon them many of these functions. The clergy of the Catholic church in the West are bound by a vow of celibacy, not formally made, but implied in their ordination as *Sub-Deacons*. This obligation of celibacy is only reckoned among the disciplinary enactments of the church. The clergy of that portion of the Greek and Armenian Church which is united in communion with the see of Rome may be married; that is, may receive orders if married, but are not allowed to marry

* The parish priest in Ireland corresponds to the Curé in France, the Curato (or, in the country, Arciprete) of Italy, and the Cura of Spain. The curate in Ireland, as in the church of England, is equivalent to the Vicaire of France and the Sottocurato of Italy.

after having taken orders. A similar discipline, if thought expedient by the church, might be introduced into the West.

The most solemn tribunal of the Catholic Church is a *General Council,* that is, an assembly of all the bishops of the church, who may attend either in person or by deputy, under the presidency of the pope or his legates. When a decree has passed such an assembly, and received the approbation of the Holy See, there is no further appeal. Distinction must be however made between *doctrinal* and *disciplinary* decrees; for example, when in the Council of Trent it was decreed to be the doctrine of the church that marriage is indissoluble, this decree is considered binding on the belief and on the conduct, nor can its acceptance be refused by any one without his being considered rebellious to the church. But when it is ordered that marriages must be celebrated only in presence of the parish priest, this is a matter of discipline not supposed to rest on the revelation of God, but dictated by prudence; and consequently a degree of toleration is allowed regarding the adoption of the resolution in particular dioceses. It is only with regard to such decrees, and more specifically the one we have mentioned, that the Council of Trent is said to have been received, or not, in different countries.

When a general council cannot be summoned, or when it is not deemed necessary, the general government of the church is conducted by the pope, whose decisions in matters of discipline are considered paramount, though particular sees and countries claim certain special privileges and exemptions. In matters of faith it is admitted that if he issue a decree, as it is called, *ex cathedrâ,* or as head of the church, and all the bishops accept it, such a definition or decree is binding and final*.

The discipline or reformation of smaller divisions is performed by provincial or diocesan synods. The first consist of the bishops of a province under their metropolitan; the latter, of the parochial and other clergy under the superintendence of the bishop. The forms to be observed in such assemblies, the subjects which may be discussed, and the extent of jurisdiction which may be assumed, are laid down at full in a beautiful work of the learned Benedict XIV., entitled 'De Synodo Diœcesana.' The acts and decrees of many such partial synods have been published, and are held in high esteem among Catholics; such are the decrees of the various synods held at Milan under the virtuous and amiable St. Charles Borromeo.

The *Laws* of the Catholic Church may be divided into two classes; those which bind the interior, and those which regulate outward conduct. This distinction, which corresponds to that above made between doctrinal and disciplinary decrees, may appear unusual, as the term *laws* seems hardly

* The great difference between the Transalpine and the Cisalpine divines, as they are termed, is whether such a decree has its force prior to, or independent of, the accession of the body of bishops to it, or receives its sanction and binding power from their acceptance. Practically there is little or no difference between the two opinions; yet this slight variety forms a principal groundwork of what are called the liberties of the Gallican Church.

applicable to forms of thought or belief. Still, viewing the Catholic Church under the form of an organised religious society, and considering that it professes to be divinely authorised to exact interior assent to all that it teaches, under the penalty of being separated from its communion, we think we can well classify under the word *law* those principles and doctrines which it commands and expects all its members to profess.

Catholics often complain that doctrines are laid to their charge which they do not hold, and in their various publications protest against their belief being assumed upon any except authoritative documents; and as such works are perfectly accessible, the complaint is reasonable and just. There are several works in which an accurate account is given of what Catholics are expected to believe, and which carefully distinguish between those points on which latitude of opinion is allowed, and such as have been fully and decisively decreed by the supreme authority of the church. Such are Veron's 'Regula Fidei,' or Rule of Faith, a work which has been translated into English, and Halden's 'Analysis Fidei.' But there are documents of more authority than these; for example, the 'Declaration' set forth by the vicars apostolic or bishops in England, in 1823, often republished; and still more the 'Catechismus ad Parochos,' or 'Catechism of the Council of Trent,' translated into English some years ago, and published in Dublin. A perusal of such works as these will satisfy those, who are desirous of full and accurate information regarding Catholic tenets, of their real nature, and will show that the popular expositions of their substance and character are generally incorrect.

The formulary of faith, which persons becoming members of the Catholic Church are expected to recite, and which is sworn to upon taking any degree, or being appointed to a chair in a university, is the creed of Pius IV., of which the following is the substance:—

The preamble runs as follows: 'I, N. N., with a firm faith believe and profess all and every one of those things which are contained in that Creed which the holy Roman Church maketh use of.' Then follows the Nicene creed.

'I most stedfastly admit and embrace apostolical and ecclesiastical traditions, and all other observances and constitutions of the same church.

'I also admit the holy scriptures, according to that sense which our holy mother the church has held and does hold, to which it belongs to judge of the true sense and interpretation of the scriptures: neither will I ever take and interpret them otherwise than according to the unanimous consent of the fathers.

'I also profess that there are truly and properly seven sacraments of the new law, instituted by Jesus Christ our Lord, and necessary for the salvation of mankind, though not all for every one, to wit: baptism, confirmation, the eucharist, penance*, extreme unction, holy orders†, and

* Under penance is included confession; as the Catholic sacrament of penance consists of three parts: contrition or sorrow, confession, and satisfaction.

† The clerical orders of the Catholic Church are

matrimony; and that they confer grace; and that of these, baptism, confirmation, and orders, cannot be reiterated without sacrilege. I also receive and admit the received and approved ceremonies of the Catholic Church, used in the solemn administration of the aforesaid sacraments.

'I embrace and receive all and every one of the things which have been defined and declared in the holy Council of Trent, concerning original sin and justification.

'I profess likewise that in the mass there is offered to God a true, proper, and propitiatory sacrifice for the living and the dead: and that in the most holy sacrament of the eucharist there is truly, really, and substantially, the body and blood, together with the soul and divinity of our Lord Jesus Christ; and that there is made a change of the whole substance of the bread into the body, and of the whole substance of the wine into the blood, which change the Catholic church calls *Transubstantiation*. I also confess that under either kind alone Christ is received whole and entire, and a true sacrament.

'I firmly hold that there is a *Purgatory*, and that the souls therein detained are helped by the suffrages of the faithful.

'Likewise, that the Saints reigning with Christ are to be honoured and invocated, and that they offer up prayers to God for us; and that their Relics are to be had in veneration.

'I most firmly assert that the Images of Christ, of the Mother of God, and also of other Saints, ought to be had and retained, and that due honour and veneration are to be given them.

'I also affirm that the power of Indulgences was left by Christ in the church, and that the use of them is most wholesome to Christian people.

'I acknowledge the holy Catholic Apostolic Roman Church for the mother and mistress of all churches: and I promise true obedience to the Bishop of Rome, successor to St. Peter, Prince of the Apostles, and Vicar of Jesus Christ.'

Then follow clauses condemnatory of all contrary doctrines, and expressive of adhesion to all the definitions of the Council of Trent.

It is obvious that this form of confession was framed in accordance to the decrees of that council, and consequently has chiefly in view the opinions of those who followed the Reformation.

Such is the doctrinal code of the Catholic church. The moral law, as taught in the Catholic church, is mainly the same as other denominations of Christians profess to follow.

Of the disciplinary or governing code we have already spoken, when we observed that it consisted of the Canon Law, which, unlike the doctrinal and moral code, may vary with time, place, and accidental circumstances.

The fundamental position, the constitutive principle, of the Roman Catholic Church, is the doctrine and belief that God has promised, and consequently bestows upon it, a constant and perpetual protection, to the extent of guaranteeing it from destruction, from error, or fatal corruption. This principle once admitted, everything else follows:—1. The infallibility of the church in its decisions on matters concerning faith. 2. The obligation of submitting to all these decisions, independently of men's own private judgments or opinions. 3. The authority of tradition, or the unalterable character of all the doctrines committed to the church; and hence the persuasion that those of its dogmas, which to others appear strange and unscriptural, have been in reality handed down, uncorrupted, since the time of the apostles, who received them from Christ's teaching. 4. The necessity of religious unity, by perfect uniformity of belief; and thence as a corollary, the sinfulness of wilful separation or schism, and culpable errors or heresy. 5. Government by authority, since they who are aided and supported by such a promise must necessarily be considered appointed to direct others, and are held as the representatives and vicegerents of Christ in the church. 6. The papal supremacy, whether considered as a necessary provision for the preservation of this essential unity, or as the principal depository of the divine promises. 7. In fine, the authority of councils, the right to enact canons and ceremonies, the duty of repressing all attempts to broach new opinions; in a word, all that system of rule and authoritative teaching which must strike every one as the leading feature in the constitution of the Roman Catholic Church.

The differences therefore between this and other religions, however complicated and numerous they may at first sight appear, are thus narrowed to one question; for particular doctrines must share the fate of the dogmas above cited, as forming the constitutive principle of the Catholic religion. This religion claims for itself a complete consistency from its first principle to its last consequence and to its least institution, and finds fault with others, as though they preserved forms, dignities, and doctrines which must have sprung from a principle by them rejected, but which are useless and mistaken the moment they are disjoined from it.

vided into two classes, *sacred* and *minor* orders. The st consists of subdeacons, deacons, and priests, who e bound to celibacy and the daily recitation of the *eviary*, or collection of psalms and prayers, occupying onsiderable time. The minor orders are four in num-r, and are preceded by the *tonsure*, an ecclesiastical remony in which the hair is shorn, initiatory to the lesiastical state.

ROMAN CATHOLICS AND JEWS. An act was passed on the 18th August, 1846, 9 & 10 Vict. c. 59, intituled 'An Act to relieve Her Majesty's Subjects from certain Penalties and Disabilities in regard to Religious Opinions.'

This act repeals various statutes or ordinances, and several acts, or so much and such parts of the said acts as are particularly specified. The first statute which it repeals is the statute or ordinance of the 54th and 55th years of the reign of King Henry III., and the statute or ordinance commonly called Statutum (de) Judæismo. The effect of this act of Victoria cannot be told in fewer words than are employed in the act itself. It relieves Jews, Roman Catholics, and Dissenters, from various penalties and disabilities; and it also gives some relief to members of the Church of England. An exposition of this act is given in the article 'Roman Catholics and Jews,' in the 'Supplement to the Penny Cyclopædia.'

ROMAN LAW. The historical origin of the Roman Law is unknown, and its fundamental principles, many of which are embodied in the legislation of Justinian, are older than the oldest records of Italian history. The foundation of the strict rules of the Roman law as to familia, agnatio, marriage, testaments, succession to intestates, and ownership, was custom.

The earliest Roman legislation of which we have any remains is the compilation called the Twelve Tables. Their object was to confirm and define perhaps rather than to enlarge or alter the Roman law, except in some few matters. The Twelve Tables were a body of constitutional law as well as other law.

Ten tables were completed and made public by the Decemviri or ten commissioners in B.C. 451, and in the following year two other tables were added. This compilation is quoted by the ancient writers by various titles: Lex XII. Tabularum, Leges XII., sometimes XII. simply (Cic., 'Legg.,' ii. 23), Lex Decemviralis, and others. The rules contained in these tables long continued to be the foundation of Roman Law, and they were never formally repealed. The laws themselves were considered as a text-book, and they were commented on by the Jurists as late as the age of the Antonines, when Gaius wrote a commentary on them in six books ('Ad Legem XII. Tabularum'). The actions of the old Roman law, called Legitimæ, or Legis Actiones, were founded on the provisions of the Twelve Tables, and the demand of the complainant could only be made in the precise terms which were used in the Tables. (Gaius, iv. 11.) The rights of action were consequently very limited, and they were only subsequently extended by the edicts of the Prætors. The brevity and obscurity of this ancient legislation rendered interpretation necessary; and both the interpretation of the laws and the framing of the proper forms of action belonged to the College of Pontifices. The civil law was thus inseparably connected with that of religion (Jus Pontificium), and its interpretation and the knowledge of the forms of procedure were still the exclusive possession of the patricians.

The Twelve Tables were not limited to what the Romans called private law, but they comprised also public law ('Fons publici privatique juris,' Liv., iii. 34). They contained provisions as to testaments, successions to intestates, the care of persons of unsound mind, theft, homicide, interments, &c.

The best works on the subject of the Twelve Tables are that by James Godefroy (Jac. Gothofredus), and the more recent work of Dirksen, 'Uebersicht der bisherigen Versuche zur Kritik und Herstellung des Textes der Zwölf-Tafel-Fragmente,' Leipzig, 1824.

For about one hundred years after the Legislation of the Decemviri, the patricians retained their exclusive possession of the forms of procedure, until Cn. Flavius published the forms surreptitiously, as it is said, and a list of the Dies Fasti and Nefasti. The book thus made public by Flavius was called Jus Civile Flavianum. The publication of these forms must have had a great effect on the practice of the law: it was in reality equivalent to an extension of the privileges of the plebeians. Subsequently Sextus Ælius published another work, called 'Jus Ælianum,' which was more complete than that of Flavius. Sextus Ælius was Curule Ædile, B.C. 200, and Consul, B.C. 198.

In the Republican period new laws (leges) were enacted both in the Comitia Centuriata and in the Comitia Tributa. The leges passed in the Comitia Tributa were properly called Leges Tributæ or Plebiscita, and originally they were merely proposals for a law which were confirmed by the curiæ. But the Lex Publilia (B.C. 336), and subsequently the Lex Hortensia (B.C. 286), gave to the Plebiscita the full force of leges without the consent of the patres (Liv., viii. 12; Gaius, i. 3; Gell., xv. 27); and a Plebiscitum was accordingly sometimes called a lex. The leges generally took their name from the gentile name of the magistrate who proposed them (rogavit), and sometimes from the name of both consuls, as Lex Ælia or Ælia Sentia, Papia or Papia Poppæa. If the proposer of the law was a dictator, prætor, or tribune, the Lex or Plebiscitum, as the case might be, took its name from the proposer only, as Lex Hortensia. Sometimes the object of the lex was indicated by a descriptive term, as Lex Cincia de Donis et Muneribus.

The Senatus Consulta also formed a source of law under the republic. It does not seem as if the Romans themselves had a very clear notion of the way in which the senate came to exercise the power of legislation; but they imagined that it arose of necessity with the increasing population of the state and the increase of public business. The senate thus became an active administrating body, and, as an easy consequence, that which it enacted (constituit) was observed, and this new source of law was termed Senatus Consultum ('Dig.,' i., tit. 2). No senatus consulta are recorded as designated by the names of magistrates till the time of Augustus; a circumstance which seems to show that, whatever binding authority senatus consulta might have acquired under the Republic, they were not then viewed as laws properly so called. But from the time of Augustus, the titles of senatus consulta frequently occur; their names, like those of most of the leges, were derived from the consuls, as S. C. Velleianum, Pegasianum, Trebellianum, &c., or of the emperor who proposed them, as S. C. Claudianum, Neronianum, &c., or they were said to be made 'auctore Principe,' or 'ex auctoritate Principis.'

A new source of law was supplied by the Edicta of those magistrates who had the Jus Edicendi, but mainly by the prætors, the prætor urbanus and the prætor peregrinus. The edicts of the prætor urbanus were the most important. The nature of the Roman Edictal Law is explained at the end of the article EQUITY.

With the establishment of the Imperial Constitution begins a new epoch in the Roman law. The leges of Augustus and those of his predecessors had some influence on the Jus Privatum, though they did not affect the fundamental principles of the Roman law. A Lex Julia, better

known as the Lex Julia et Papia Poppæa, had for its object the encouragement of marriage, but it contained a great variety of provisions. A Lex Julia de Adulteriis, which also contained a chapter on the Dos, is of uncertain date, but was probably passed before the former Lex Julia came into operation.

The development of the Roman law in the Imperial period was little affected by direct legislation. New laws were made by Senatus Consulta, and subsequently by the Constitutiones Principum; but that which gives to this period its striking characteristic is the effect produced by the Responsa and the writings of the Roman jurists.

So long as the law of religion or the Jus Pontificium was blended with the Jus Civile in its limited sense, and the knowledge of both was confined to the patricians, jurisprudence was not a profession. But with the gradual separation of the Jus Civile and Pontificium, which was partly owing to the political changes by which the estate of the plebeians was put on a level with that of the patricians, there arose a class of persons who are designated as Jurisperiti, Jurisconsulti, Prudentes, and by other equivalent names. Of these jurisconsulti the earliest on record is Tiberius Coruncanius, a plebeian, pontifex maximus, and consul B.C. 280: he is said to have been the first who professed to expound the law to any person who wanted his assistance; he left no writings, but many of his Responsa were recorded. Tiberius Coruncanius had a long series of successors who cultivated the law, and whose responsa and writings were acknowledged and received as a part of the Jus Civile; that is, in some way they were received as authority. Augustus, it is said, gave the responsa of the jurists a different character. Before his time, their responsa, as such, could have no binding force, and they only indirectly obtained the character of law by being adopted by those who were empowered to pronounce a sentence. Augustus gave to certain jurists the respondendi jus, and declared that they should give their responsa 'ex ejus auctoritate.' But it is not clear in what manner this was done. The exposition of Savigny is given in his 'System,' &c., vol. i., s. 26; and that of Puchta, perhaps a better explanation of this institution of Augustus, is contained in his 'Institutionen,' vol. i., s. 116, &c., 1st edition.

The commencement of a more systematic exposition of law under the Empire is indicated by the fact of the existence of two distinct sects or schools (scholæ) or jurists. These schools originated under Augustus, and the heads of each were respectively two distinguished jurists, Antistius Labeo and Ateius Capito. Much has been written on the characteristics of these two schools; but nearly all that we know is contained in the few words of Pomponius, of which Puchta ('Cursus der Institutionen,' i. 433) has given perhaps the most satisfactory exposition.

The jurisprudentes were not only authorised expounders of law, but they were most voluminous writers. The commentators on the Edict were also very numerous, and among them are the names of Pomponius, Gaius, Ulpian, and Paulus. Gaius wrote an elementary work, which furnished the model of the Institutiones of Justinian. Commentaries were also written on various Leges, and on the Senatus Consulta of the Imperial period; and finally, the writings of the earlier jurists themselves were commented on by their successors. The long series of writers to whom the name of classical jurists has been given, ends, about the time of Alexander Severus, with Modestinus, who was a pupil of Ulpian. Some idea may be formed of the vast mass of their writings from the titles of their works as preserved in the 'Digest,' and from the 'Index Florentinus;' but, with the exception of the fragments which were selected by the compilers of that work, this great mass of juristical literature is nearly lost.

Among the sources of law in the Imperial period are the Imperial Constitutiones. [Constitutions, Roman.]

With the decline of Roman jurisprudence began the period of compilations, or codes, as they were termed. The earliest were the Codex Gregorianus and Codex Hermogenianus, which are only known from fragments. Though these codes were mere private collections, they apparently came to be considered as authority, and the codes of Theodosius and Justinian were formed on their model.

The Code of Theodosius was compiled under the authority of Theodosius II., emperor of the East. It was promulgated as law in the Eastern Empire, A.D. 438; and in the same year it was confirmed as law in the Western Empire by Valentinian III. and the Roman senate. This code consists of sixteen books, the greater part of which, as well as of the Novellæ, subsequently promulgated by Theodosius II., are extant in their original form. The valuable edition of the Theodosian Code, by J. Gothofredus (6 vols. fol., Lugd., 1655), re-edited by Ritter, Leipzig, 1736-1745, contains the first five books and the beginning of the sixth, only as they are epitomised in the Breviarium; and this is also the case with the edition of the 'Jus Civile Antejustinianeum,' published at Berlin in 1815. The most recent edition of the 'Jus Civile Antejustinianeum' is that of Bonn, 1835 and 1837.

The legislation of Justinian is treated of under Justinian's Legislation.

ROMAN SCHOOL OF PAINTING. [Painting.]

ROMAN WALL. [Britannia.]

ROMANCE originally signified any composition in the Romance language, or dialects which superseded the Latin after the fall of the Western Empire. [Romance Language.] In course of time the name was applied to compositions, whether in verse or prose, in any language, which treated of marvellous or uncommon incidents, and the name has been retained to this day in several European languages, to signify a fictitious narrative. The Italians and French call a novel 'un romanzo,' 'un roman.' But the French call an historical ballad 'une romance,' in the feminine gender. The appellation Romance in a narrower sense is applied to those compositions which refer

to the ages of chivalry, either real or supposed. [CHIVALRY.]

The oldest romances in this latter sense appear to have been legendary stories concerning Arthur and the Knights of the Round Table. The earliest romantic legends which have come down to us are of the 12th century: Geoffrey of Monmouth's Latin Chronicle of England; Turpin's Latin Chronicle in France; Wace's 'Le Brut,' a metrical romance concerning the fabulous history of England, in Norman French; 'Le Roman du Rou,' by the same writer, concerning Rollo and his successors; and 'I Reali di Francia,' in Italian prose. To these may be added the Latin romance of Gualtieri, found in the Chronicle of La Novalesa, which relates to the wars of Attila. Next in order of date comes Guido della Colonna's 'War of Troy,' and Matthew Paris's account of the Round Table. [GEOFFREY OF MONMOUTH.] The 'Roman de la Rose' was written under St. Louis of France. At that time chivalry was established over all Europe, and the writers of romance introduced the customs and manners of chivalry into their narratives of events, real or supposed, long antecedent to the existence of chivalry.

The vast subject of romantic literature, in its general and more extended sense, may be divided into the following branches:—1. Romantic ballads and traditional songs, which appears to be the oldest form, and which have existed among most nations in their primitive state. 2. The narrative romances of chivalry concerning the deeds of Arthur and the Peers of the Round Table. 3. The romances concerning the supposed wars of Charlemagne against the Saracens. 4. The Spanish and Portuguese romances concerning the fabulous exploits of Amadis and Palmerin. [AMADIS DE GAULA.] 5. The classic romances concerning Jason, Hercules, Alexander, those heroes having been transformed into knights of chivalry. 6. The epic romances of the Italians in the 15th and 16th centuries. [PULCI; ARIOSTO.] 7. The spiritual or religious romances concerning the miracles of saints and the death of martyrs, such as the 'Contes Dévots' of the French, the 'Golden Legend,' &c. 8. The pastoral romance, which Cervantes ridiculed, and which afterwards gave rise in the 17th century to the interminable and dull romances of La Calprenède, Madame de Scudery, and others. 9. The comic romances, which were written chiefly as parodies of the heroic and chivalrous romances. Such were those of Rabelais, Cervantes, Mendoza, and Scarron. 10. The political romances, such as Télémaque, Sethos, &c. 11. Lastly comes the modern *Novel*, which forms a distinct species, as it does not deal in the marvellous and supernatural, but represents men conformably to the manners of the age in which they lived.

ROMANCE LANGUAGE ('Langue Romane,' or 'Romande,' in French) is the name given to a kind of bastard Latin, which came into common use in Western Europe after the fall of the Roman Empire among the populations formerly subject to Rome, while the Northern conquerors, the Goths, Franks, Burgundians, Longobards, &c., spoke their own language or dialects, which are called by chroniclers of the times, 'Lingua Teutonica' or 'Teutisca.' The conquered people were called by the general name of Romans, from whence came the name of the language, which was also called 'vulgaris.' In course of time however the conquerors adopted the language of the conquered, who, being more instructed, furnished most of the priests and scholars of the age. But the language thus adopted by both the conquering and conquered races, although essentially formed of Latin elements, differed according to the various localities and the greater or less degree of admixture of the northern people with the Roman population.

Of the various dialects thus formed, that of the south of France, called afterwards Langue d'Oc, became a refined language sooner than the others, and retained its superiority from the tenth to the 13th century, when the Italian, Portuguese, and Spanish languages assumed a regular grammatical and literary form, which they have retained; whilst the Romance of the south of France has gradually fallen into disuse, having given way to the Northern French Langue d'Oil or d'Oui. The latter appears to have originally differed little from the Langue d'Oc, but it gradually changed its terminations, and assumed other peculiarities of form, which have been retained by the modern French. It is demonstrated by Raynouard that the inhabitants of Northern France in the ninth century spoke the same language as those of the south.

The gradual process by which the corrupt Latin spoken in the provinces of Western and Southern Europe in the sixth, seventh, and eighth centuries was transformed into the Romance languages of the ninth and tenth centuries, is very clearly exhibited by Raynouard in his 'Elémens de la Grammaire de la Langue Romane avant l'an 1000.' The Latin cases had become neglected or confused, and to supply their place the propositions *de* served to denote the genitive and *ad* the dative. The next step was to cut off the final syllable of the noun, and so to make it indeclinable. Thus the accusative abbatem became abbat; majestatem, majestat; ardentem, ardent; amantem, amant; and so forth. The accusatives in *ionem* were reduced to *ion*, religionem, religion, &c. When the suppression of the Latin termination left two harsh-sounding consonants at the end of the word, a euphonic vowel was added, 'arbitr-um,' 'arbitr-e.' The pronouns *ille* and *ipse* had been used in the corrupt Latin as auxiliary to substantives: 'Dono illas vineas quomodo ille rivulus currit;' 'Illa medietate de ipsa porcione,' &c. From *ille* so used originated the Romance articles *el, lo, la;* and from *ipse* the demonstrative pronouns *is, so* or *su*, and *sa*, which the Sardinian dialect has retained to this day as an article. These articles were declined with the prepositions *de* and *a*.

After A.D. 1000, the Romance language may be considered as fully formed, and the age of the troubadours began. In the 13th century, it was on its decline, and the Italian or Tuscan rose upon its decay. When Dante appeared, the decline had begun, and it was completed during

the first part of the 14th century. The Langue d'Oil, or Northern French, sometimes called Norman French, having become the language of the court and of the capital, gradually encroached upon the Langue d'Oc, as the provinces south of the Loire became incorporated with the monarchy. The invention of printing favoured the extension of the Langue d'Oil; and in the 16th century it was enacted that all public acts and deeds should be written in the Langue d'Oil or the French, as it was called. The Langue d'Oc was thus restricted to mere domestic purposes, and ended with becoming a patois or dialect, of which there were several varieties.

The corrupt Latin of Spain gave rise to the Catalonian and Valencian, the old Portuguese or Galician, and the Castilian or modern Spanish. The last two, and especially the Castilian, received a considerable admixture of Arabic words, from which the Catalonian remained comparatively free. It is impossible to fix the epochs of the origin of the various languages of the Spanish Peninsula. The Catalonian and Galician, or old Portuguese, appear to be the oldest. The Castilian, notwithstanding the assertion of Bouterwek to the contrary, was not formed in the 11th century. Its oldest existing monument, the poem of 'El Cid,' is not older than the year 1200. Previous to the 12th century the Galician, or old Portuguese, appears to have prevailed in all Western Spain.

The Catalonian dialect became early a literary language, and as such subject to fixed grammatical rules; it has its grammars and dictionaries, a great number of printed books, and a still greater number of MSS. It had its historiáns; among others an anonymous historian of Catalonia, mentioned by Zurita in his 'Chronicas de Aragon,' Bernard de Sclot, who lived in the 13th century, and wrote a history of the principality of Catalonia and of the Aragonese kings subsequent to the junction of the two states; and King Jayme I. of Aragon, who wrote an account of his own reign. The Catalonian is of all living languages that which most resembles the old Romance of the Troubadours, and that of the Valdenses of Pignerol in Piedmont is the next.

In Italy, the dialect of the valleys of Pignerol, or of the Valdenses, has great affinity to the old Romance, as already observed. The Piedmontese, which is a written language, and is spoken by all classes of people, bears also considerable affinity to the modern Romance dialects of Southern France.

With regard to the other North Italian or Lombard dialects, they differ more or less from the old Romance language, though they had a common and perhaps coeval origin with it, and resemble it more than the Italian or Tuscan. The Langue d'Oc, having been formed chiefly from a corrupt and provincial Latin, as well as the dialects of Italy, reduced its materials to a regular form sooner than they did; and having become a polished and literary language, the Italians in their turn borrowed at second-hand from it. Raynouard, in his 'Grammaire Comparée,' observes that the dialect of Ferrara is one of those which has retained more completely the forms of the Romance with the least admixture.

The dialects of Western Switzerland, Vaud, Neuchâtel, Geneva, part of Freyburg, and Lower Valais, and also of Savoy, have retained to this day the name of Patois Romand, or Langue Romande. Some of the dialects of Western Switzerland approximate in their inflexions to the Northern French, or Langue d'Oil, whilst others, like that of Gruyère in the canton of Freyburg, bear more affinity to the Romance of the south, and consequently to the Italian. To this day Switzerland is divided, by languages, races, and habits, into German and Romande, and the Germans call the latter by the general name of Wälschland.

In the country of the Grisons, or ancient Rhæti, one half of the people speak a language called Rumonsch, which is an Italian dialect of very ancient formation. The Rumonsch is a written language, and books have been published in it. The dialect of the Engadina, or valley of the Inn, is called Ladin; it has still greater affinity to the Italian or Lombard dialects.

If we take the appellation of Romance Language in its most extended sense, all the languages and dialects of Western Europe, that is to say, of Italy, Western Switzerland, the Grisons, France, and Spain, may be called Romance, being derived essentially from the Roman or Latin, and having been formed after the fall of the Western Empire. The Basque and the Armorican, or language of Lower Britanny belong to a different family. The Walloon of Liège and the Wallachian are also Romance languages. The Wallachian resembles the others, though less perhaps in its grammatical forms than in the etymology of the words. Raynouard shows the analogy existing between them all in their grammatical construction and etymology in his 'Grammaire Comparée des Langues de l'Europe Latine.' But if we take the word Romance in its more restricted sense, as having been especially applied to the language of the troubadours, or Langue d'Oc, we must consider it as confined to the South of France, and the eastern provinces of Spain as far as Murcia; and it is there that we find its legitimate offspring in the languages of Catalonia, Valencia, and Majorca, and the Languedocian, Provençal, and Valdenses dialects.

ROMANELLI, GIOVANNI FRANCESCO, was born at Viterbo in 1617. He studied a short time under Domenichino, but he is chiefly known as the scholar of Pietro da Cortona. Romanelli's picture of the Deposition, in the church of Sant' Ambrogio della Massima, gave him a temporary reputation above all his rivals, which induced Pietro da Cortona to paint for the same church his San Stefano, which far eclipsed the picture of Romanelli. Romanelli showed more delicacy of execution but less power than Cortona. There is a Presentation in the Temple in one of the chapels of St. Peter's, worked in mosaic, from a picture by Romanelli which is in the church of the Certosa. He died at Viterbo in 1662.

ROMANO, GIULIO. [Giulio Romano.]

ROMANS. [Drôme.]

ROMANS, EPISTLE TO THE. The Epistle to the Romans has been almost universally admitted to be the work of St. Paul.

According to the most probable opinion, the Epistle was written towards the end of 57 or in the beginning of 58, when St. Paul was at Corinth, and on the point of setting out to Jerusalem with the 'contribution made by them of Macedonia and Achaia for the poor saints which were at Jerusalem' and in Judea. (Chap. xv., ver. 25, 26.)

The Epistle was dictated in Greek by the Apostle to Tertius, his amanuensis (xvi. 22), and conveyed to the church at Rome by Phœbe (xvi. 1), a servant or deaconess of the church at Cenchreæ, a place not far from Corinth.

ROMA'NUS I., an Armenian by birth, served with distinction under Leo the Philosopher and his son Constantine Porphyrogennetus, who made him Great Admiral. Romanus gave his daughter Hélena in marriage to the Emperor, who made him his colleague in the Roman Empire, A.D. 919. Romanus became in fact the real Emperor, the weak character of Constantine not being equal to the cares of the state. His own sons however, whom he had named Cæsars, conspired against him, and having seized him, they confined him to a convent (A.D. 945), where he died in the year 948. His two sons did not reap the fruit of their unnatural treachery; they were seized by order of Constantine, and banished to a convent.

ROMA'NUS II., son of Constantine Porphyrogennetus, and grandson, by his mother's side, of Romanus I., poisoned his father, and succeeded him, A.D. 959. He showed himself as incapable as he was unworthy of the throne. After a reign of little more than four years, he died in 963, it is said of poison administered by his wife Theóphana. His widow became regent and guardian of her infant children, and she soon after married Nicéphorus Phocas.

ROMA'NUS III., of a patrician family and senator of Constantinople, was chosen his successor by Constantine IX., and the Emperor gave him in marriage his daughter Zoe. He succeeded Constantine A.D. 1028. The beginning of his reign was favourable, but his armies were afterwards defeated by the Saracens, and he became stern, avaricious, and unpopular. His wife Zoe, much younger than himself, having formed a guilty connection with an obscure individual called Michael of Paphlagonia, caused her husband to be murdered in the year 1034, upon which she married Michael, and placed him on the throne.

ROMA'NUS IV., DIO'GENES, of a noble family, was a soldier in the reign of Constantine Ducas, and after that emperor's death was chosen by his widow Eudocia for her husband and her partner on the throne, A.D. 1068. He passed with an army into Asia, and carried on a successful war against the Turks, whom he drove beyond the Euphrates. Having afterwards entered Armenia, he was defeated by Alp Arslan, sultan of the Turks, and taken prisoner. He was kindly treated by his conqueror, and obtained his liberty by paying a heavy ransom. In the meantime a revolution had taken place at Constantinople, where Michael, son of Constantine Ducas, had risen against his mother, and shut her up in a convent. Romanus on his way homewards was seized by order of Michael, was deprived of his sight, and banished to the island of Prinkipos, in the Sea of Marmara, where he soon after died, A.D. 1071.

ROMBERG, ANDREAS and BERNHARD, German composers, were cousins.

Andreas Romberg was born at Osnabrück in 1767; *Bernhard* in 1770. Both held appointments in the royal chapel of the Elector of Cologne, at Bonn, about the year 1790. The former was distinguished by his superior performance on the violin; the latter as an almost unrivalled player on the violoncello; and both by their compositions, even at that early period of their career. The progress of the French armies at the commencement of the revolutionary war drove the two cousins to Hamburg. In 1795 they quitted that city, and visited Germany and Italy. They returned to Hamburg in 1797, where the elder remained; but the younger left that city two years after, and proceeded through England and Spain to Lisbon, and subsequently obtained a situation in the royal chapel at Berlin. Andreas in the meantime turned his attention more exclusively to composition, and produced four operettas; he also set Schiller's 'Ode to Music.' For the church he wrote a 'Dixit Dominus' and a 'Te Deum,' each for four voices, and a 'Pater Noster' for three, besides many psalms. For the chamber or concert-room he composed much music, Schiller's 'Song of the Bell' ('Das Lied von der Glocke'), among other things. He also produced two full operas, 'Die Grossmuth des Scipio' ('The Magnanimity of Scipio'), and 'Die Ruinen von Paluzzi' ('The Ruins of Paluzzi'). Bernhard, while in Berlin, wrote two operettas and much instrumental music, particularly for the violoncello. Andreas Romberg died in 1821; Bernhard in 1841.

ROMBOUTS, THEODORE, a painter, was born at Antwerp in 1597, and studied under Abraham Jansens until he was twenty years of age, when he went to Rome. After residing at Rome a few years, he was invited to Florence by the grand-duke of Tuscany, and executed for that prince several large historical works for the palace. After an absence of eight years, Rombouts returned to Flanders, and established himself in his native city in 1625. He was engaged to paint in the churches, and his pictures excited much admiration. Rombouts attempted to rival Rubens, and though he did not succeed, his failure was unattended by disgrace. The works which he executed in competition with Rubens were St. Francis receiving the Stigmata; the Sacrifice of Abraham in the Church of the Recollets; and Themis with the attributes of Justice, in the town-house of Ghent. The Taking Down from the Cross, in the cathedral of the same city, is a composition which proves that Rombouts possessed most of the qualities of a great master. He died at Antwerp in 1637, according to Houbraken, or according to Weyermans in 1640.

ROME, ROMA, the chief town of the Papal State, is situated in the Campagna, on the Tiber, 15 miles from the sea-coast, in 41° 54′ N. lat. and

12° 28′ E. long. The Campagna about Rome is a kind of table-land with an undulating surface, crossed by groups and ridges of low hills, and it slopes towards the south-west with a rapid descent to the alluvial marshy tract of the Maremma, which extends along the coast of the Mediterranean. The descent from the dry table-land of the Campagna to the maritime plain occurs, as we follow the right bank of the Tiber, about ten miles below Rome, and two miles and a half above Capo due Rami, or the bifurcation of the Tiber. At that point the table-land is about 100 feet above the sea. On the left or southern bank the descent is nearer the bifurcation, above the Marsh of Ostia. Farther south-east, the villages of Pratica (the ancient Lavinium) and Ardea stand on the edge of the slope.

The site of Rome consists partly of several strips of low land on both banks of the Tiber, and partly of the table-land of the Campagna, which rises on both sides from 150 to 200 feet above the river. The projections of this table-land which advance towards the river have been called hills; and hence the name of the Seven Hills. After the enlargement of the city walls by Aurelian, these hills or projections were more than seven. On the right bank of the river, the Vatican and the Janiculus, which are within the modern city, are a continuation of the ridge of Monte Mario, which is outside of the walls to the north, and is 450 feet above the sea, and of Monte Verde to the south. On the left or eastern bank, the table-land of the Campagna extends, within the walls of Rome, in a semicircular shape, forming several projections to the west towards the river. The low grounds between these projections and the river constitute the Campus Martius, on which the greater part of modern Rome is built. Beginning from the north, the first projection of high lands within the walls is Monte Pincio (the ancient Collis Hortulorum); farther east, and partly separated from it by a depression or ravine, is the Quirinal, and still farther south-east the Esquiline. Between the Quirinal and the Esquiline is a smaller projection, Mount Viminalis, but it is now hardly distinguishable from the other two. The Quirinal, Viminal, and Esquiline are joined on the east, within the walls of Rome, by a plateau which is about 150 feet above the ordinary level of the Tiber, and slopes gently towards the country outside of the walls. The highest points of the Esquiline and the Quirinal are nearly 200 feet above the Tiber. South of the Esquiline, and separated from it by a depression or valley, is Mount Cælius, which slopes eastwards towards the country outside of Porta San Giovanni, and is also divided on the south from the Aventine by the valley of the Aqua Crabra or Marrana. Within the space enclosed between the table-land and the Tiber, and in the middle of the ancient city, there are three small insulated hills, the Palatine, the Aventine proper, and the Capitol, of which the Aventine is the most southern and the Capitol the most northern. The Capitol rises between the south-western extremity of the Quirinal and the left bank of the Tiber, and nearly fills up the intermediate space. The ancient city of Rome, before the time of Aurelian, lay south and east of the Capitol, and along the Palatine, Aventine, Cælian, Esquiline, and Quirinal Hills: the main part of modern Rome lies north of the Capitol.

The Tiber, on approaching Rome from the north, makes a sweep to the east towards the base of Monte Pincio, receding from Monte Mario and the Vatican Hill on its right bank; but on reaching Ripetta within the city, the river makes a bend to the westward and flows along the north-eastern base of Mount Janiculus, after which it turns again to the east as far as the base of the Capitol. It then turns again to the south-west, sweeping past the base of the Aventine, and along the southern extremity of the Janiculus. It then assumes a course south by east. The level space between the Vatican Mount, the north end of the Janiculus, and the right bank of the river, is the Vatican field. It contains the Borgo, or suburb of Rome, enclosed by the popes, and St. Peter's church, the Vatican palace, and their appurtenances. The space between the long ridge of Mount Janiculus and the right bank of the Tiber constitutes the district of Transtevere, which is another suburb of Rome. The space on the left bank running north and south, and between the great western bend of the river and the eastern hills, is the site of the modern city, which extends also along the slope of the Pincian, Quirinal, part of the Esquiline, and the Capitol, forming a kind of triangle, of which the apex is to the north, at the Porta del Popolo, and the base extends from Santa Maria Maggiore on the east, to the Tiberine island on the west, a distance of about a mile and a quarter, whilst from the Porta del Popolo to the foot of the Palatine opposite Ponte Rotto, the farthest southern point of modern Rome, the distance is rather more than a mile and a half. All to the south and east of these limits, forming about two-thirds of the area within the walls, consists of ruins, gardens, and fields, with some churches, convents, and other scattered habitations.

The present line of walls of Rome proper on the left bank of the river is supposed to be that traced by Aurelian, restored by Honorius, and afterwards by Belisarius, and since renewed by several popes. It is an irregular polygon, of which the longest diameter is three miles in length from north-west to south-east, from the Porta del Popolo to the Porta San Sebastiano on the Appian Road. The whole circuit of the present walls, including those of Transtevere and of the Borgo or Vatican, is between fourteen and fifteen miles. The wall is of brick mixed with stones and rubbish, and has been often repaired. It varies in height, but in most places does not exceed 15 feet. It has no ditch, but is flanked by towers and bastions, which were last repaired by Pope Benedict XIV. Rome has sixteen gates, some of which however are walled up.

There are only two places on the banks of the Tiber within Rome where there is a sort of quay or landing-place. There are three bridges across the Tiber within Rome; the northernmost is Ponte Sant'Angelo, the Pons Ælius, built by

Hadrian, and restored by several popes. It is about 300 feet long, but the width of the bed of the river is not more than 200 feet. The Ponte Sisto, formerly Pons Janiculensis, built originally by Marcus Aurelius, and rebuilt by Sixtus IV., is about 300 feet long, the bed of the river being 230 feet wide. About half a mile lower down is the island of San Bartolomeo, the ancient Insula Tiberina, which is joined to the main land by two bridges. There are also within Rome the remains of three ancient bridges: the Triumphalis, called also Vaticanus, just below Sant'Angelo, of which the piers have fallen into the bed of the river and occasion a rapid; the Pons Palatinus, now called Ponte Rotto, of which three arches remain on the Transtevere side; and lastly, the Pons Sublicius, at the foot of the Aventine, the first bridge built by the Romans, of which there are very few vestiges.

Rome is divided into fourteen districts, called Rioni, which however do not correspond in their boundaries to the Regiones of the ancient city. The modern Rioni are of very unequal extent, their boundaries being determined with reference to the population included within them. The inhabited part of the city contains eleven Rioni. The whole of the ancient or southern city is comprised within three extensive Rioni, namely, Monti, on the north-east; Campitelli, south-east; and Ripa, south-west.

The modern town of Rome may be conveniently divided, for the sake of topographical description, into three great divisions: 1, the lower part of the town between the eastern hills, the Tiber, and the Capitol; 2, the upper town, along the eastern hills; 3, the part of the town which is on the right bank of the Tiber.

The lower town, which occupies the site of the ancient Campus Martius and Campus Tiberinus, is the seat of all the trade. It is crossed in its central part from north by west to south by east by the street Del Corso, which is about one mile in length from the Piazza del Popolo, or great northern entrance of Rome, a handsome open place, with an obelisk in the middle, to the palace of Venice, near the foot of the Capitol. Two other streets branch out from the Piazza del Popolo, on the right and left of the Corso. One leads south-east to the fine open place called Piazza di Spagna, the great resort of foreigners, at the foot of the Pincian Mount, after crossing which, it continues in the same direction to the College of Propaganda at the foot of the Quirinal. The other street, called Ripetta, runs in a south direction, parallel to the bank of the Tiber, and then, following the bend of the river, leads, under a different name, to the bridge of Sant'Angelo.

About the middle of the Corso is a square, called Piazza Colonna, from the ancient pillar, the Antonine Column, which stands in the middle of it. Immediately to the west of the Piazza Colonna is an irregular square, which crowns a slight eminence called Monte Citorio, or Citatorio, a small hill which rises in the middle of the Campus Martius. It contains a fine building, called Curia Innocenziana, in which the courts of justice sit: a handsome obelisk stands in front of it. Returning to the Corso, and following it southwards, we meet with a street on the left, which leads to the Fontana di Trevi, the handsomest fountain in Rome, and then we come to another street, leading to the ascent of the Quirinal, or Monte Cavallo. Farther up the Corso, on the right, is a wide street, called Strada del Gesù, which leads to the splendid church and convent of that name, the head-quarters of the Order of the Jesuits, from whence, turning to the left, is a street that leads to the foot of the Capitol. The whole of this part of the city, in the neighbourhood of the Corso, consists chiefly of regular and substantial buildings; such as the Palazzo Borghese, Ruspoli, Ghigi, and others; besides many churches.

West of the Corso, and between it and the Tiber, is a dense mass of irregular streets, a busy part of the town, containing market-places, shops, and inferior dwellings, with here and there a fine building. Towards the centre of this district is the fine oval place called Piazza Navona (the ancient Circus Agonalis), one of the largest in Rome, with its fountains, by Bernini, its three churches, and the modern palace Braschi at one extremity of it. The university called La Sapienza is in the neighbourhood. Between it and the Corso is the Rotunda, or Pantheon, next to which is the Palazzo Giustiniani, and on the other side of it is the large church and Dominican convent of La Minerva.

Near the left bank of the Tiber, and parallel to it, runs a handsome regular street, called Strada Giulia, about three-quarters of a mile long, from Ponte Sisto to Ponte Sant'Angelo. This district, though well built, is dull, when compared with the Corso and the adjoining streets.

South of Ponte Sisto, along the left bank of the Tiber, and extending round the western base of the Capitol to the foot of the Palatine, is the lowest, meanest, and dirtiest part of modern Rome. It is partly occupied by the Jews, who inhabit, to the number of 4000, several narrow filthy alleys, in rows of tall old houses, near the river side, between Ponte Sisto and Ponte San Bartolomeo. The district is called the Ghetto.

Farther south, along the left bank of the river, is a succession of narrow streets, extending to the foot of the Palatine, with some of the most ancient churches in Rome, especially Santa Maria in Cosmedin, built in the third century of our æra. In the same neighbourhood are the churches of San Giorgio in Velabro, Santa Anastasia, Santa Maria Egiziaca, and of San Teodoro, said to be on the site of the temple of Romulus, on the Palatine, at the southern extremity of the inhabited part of modern Rome, on the left bank of the Tiber. Beyond it, the Aventine, Palatine, and Cælian Hills stretch to the south and south-east. They are occupied with fields and gardens, and contain several churches, convents, and ruins. The Villa Mattei occupies a considerable space on the Cælian Hill. The group of buildings connected with the Basilica of San Giovanni, at the eastern end of the Cælian, is noticed under LATERAN. The Colosseum, triumphal arches, and other ancient remains are briefly noticed hereafter.

South of the Aventine, and between it, the Tiber, and the walls, is a large space of low ground laid out in fields, part of which are common, and go by the name of 'Prati del Popolo Romano.' An artificial hill, called Mount Testaccio, rises on one side of them: it is formed of a quantity of broken earthenware (testæ) and other rubbish which has been thrown and has accumulated here from ancient times, and over which a green turf has formed. The modern Romans have excavated cellars in the side of the hill, where they keep their wine cool, and the place is resorted to on holidays by the people of Rome. On the other side, by the gate of San Paolo, is the Protestant burying-ground, and near it is the pyramid of Caius Cestius.

The upper town, or eastern part of modern Rome, stretches up the slope of the Pincian and Quirinal Hills, and occupies also part of the plateau which unites all the eastern hills of Rome. This part consists chiefly of palaces and villas, of churches, convents, and other large buildings, with spacious courts and gardens, and is intersected by two fine long streets, which cross each other at right angles on the summit of the Quirinal, forming there a small circus, with a fountain at each bifurcation, from which the place has received the name of Le Quattro Fontane. On the plateau of the Pincian is a fine walk, laid out during the French occupation under Bonaparte. The Piazza Barberini, which is between the Pincian and the Quirinal, contains the Palazzo Barberini, one of the largest in Rome. South of the Piazza Barberini is the Quirinal, on the summit of which is the extensive pontifical palace and garden. At Rome it is commonly called Monte Cavallo, from the two colossal statues of Castor and Pollux, with their horses, which stand in the square before the palace. A fine street, about a mile in length, leads from the square of the pontifical palace along the plateau of the Quirinal to Porta Pia, passing near the Thermæ of Diocletian. It is crossed at the Quattro Fontane by another street, leading from the Piazza Barberini to Santa Maria Maggiore, from whence several streets lead to Porta Maggiore, Porta San Lorenzo, and Porta San Giovanni. The magnificent church of Santa Maria Maggiore on the Esquiline Hill, which here joins the Quirinal, is the eastern extremity of modern Rome. Beyond it, north, east, and south, the whole expanse of the Esquiline is occupied by gardens, villas, and fields, with some solitary churches.

Between the west slope of the Esquiline and the south slope of the Quirinal are several streets inhabited chiefly by the lower orders, which extend to the Campo Vaccino. Farther north, at the foot of the Quirinal, and in the gap between it and the Capitoline Mount, is the piazza which contains Trajan's column.

The Capitoline Mount and its buildings are described under CAPITOL.

The third great division of modern Rome, which lies on the right bank of the Tiber, consists of two distinct parts: Il Borgo, or Vatican, and Transtevere, properly so called, which are divided from one another by an inner wall. The

Borgo, or Città Leonina, extends from the bridge of Sant' Angelo to the Place of St. Peter's. The group of buildings constituting St. Peter's and the Vatican palace are described under VATICAN. The other remarkable building in the Borgo is the great charitable establishment of Santo Spirito, the largest in Rome, situated close to the right bank of the Tiber. It comprises an hospital for the sick, which in the summer months contains from 1000 to 1200 patients at a time, a foundling hospital, and a lunatic asylum.

The castle Sant' Angelo (of which the massive circular tower was built by Hadrian for his mausoleum, and the fortifications around it, consisting of ramparts, ditches, and bastions mounted with cannon, were begun by Pope Boniface IX. and continued by successive popes,) is the citadel of Rome, but it is not capable of a regular defence. It serves as a state prison and also as a house of correction.

The district called Transtevere lies south of the Borgo and between the Janiculus and the Tiber, and communicates with the Borgo by the handsome gate of San Spirito. The Janiculus is a long straight ridge about a mile and a half long from north to south, and it rises nearly 300 feet above the level of the river. In the northern half of its length it rises almost immediately from the bank of the Tiber, leaving sufficient level ground for a street, which from its length is called La Lungara. This street contains some fine buildings.

Towards the southern end of the Lungara the hill recedes farther from the banks of the river, which here makes a bend to the east, and it is within this bend that the great bulk of the district called Transtevere is situated. Some of the streets run up the Janiculus to the gate of San Pancrazio, but the higher part of the hill is chiefly unbuilt, though it is enclosed within the walls. The villa Spada is in this part, near the gate, outside of which is the villa Pamfili, a favourite promenade of the youth of Rome, with shady walks, waterworks, and clusters of lofty umbrella pines; but the place received much injury during the siege of Rome by the French in 1849. In a commanding situation is the fountain of L'Acqua Paola, the largest in Rome, which appears at a distance like a triple triumphal arch with streams of water rushing through: it was constructed by Paul V. with the marble taken from a temple of Minerva.

There are about 300 churches in Rome, most of which are worthy of notice, either for their architecture, their paintings, or other ornaments.

The palaces of the nobility form another class of interesting objects. Many of them are real palaces, buildings of princely magnitude and imposing style, containing vast courts and long ranges of spacious apartments. In point however of interior comfort, neatness, or splendour, most of them are sadly deficient. Several of the Roman palaces are partly let to lodgers, and the owners occupy only one floor or part of a floor.

The villas of the Roman nobility are more pleasant than their palaces. They are somewhat in the taste of the splendid villas of the old Romans, with a profusion of architectural display,

and marbles, fountains, and retired walks. Several of the villas of Rome are within the walls, such as Medici, Piombino, Mattei, Corsini; others are outside the walls.

The numerous handsome fountains form another peculiar ornament of modern Rome. Rome is better supplied with good water than most continental towns, and was much more abundantly supplied in ancient times. Of the ancient aqueducts, three still continue to carry water into the town, having been repaired by the popes. The first is that of the Acqua Vergine, the best in quality, which comes from near the ancient Collatia, fourteen miles north of Rome: it supplies a great part of the lower town, and feeds thirteen public fountains. The second is the Acqua Felice, the ancient Aqua Marcia and Claudia, restored by Pope Sixtus V. (Felice da Montalto): it comes from the east, and supplies the upper or eastern part of the town, and feeds twenty-seven public fountains. The third aqueduct, called Acqua Paola, the ancient Alsietina, enters Rome by Mount Janiculus, and supplies both Transtevere and the Vatican, feeding the Fontana Paolina, and the splendid fountains before St. Peter's: passing the Ponte Sisto by conduits, it supplies the adjoining fountain and the neighbouring district of Strada Giulia. Tournon observes that the supply of water thus carried into Rome is much greater than that carried by the Canal de l'Ourcq into Paris for the supply of a population six times as large as that of Rome.

The obelisks which adorn most of the squares of Rome are another peculiar feature of this city. [Obelisk.]

The streets of Rome are generally narrow, but many of them are straight and regular, and the great number of open spaces, such as squares, places, gardens, and large courts, renders the town generally airy. The pavement of the streets is made of selci, or small cubes of basaltic stone, not very agreeable to pedestrians, especially as there are no footpaths except along the Corso. The streets are lighted with oil lamps. Rome is provided with a regular system of sewers, partly ancient and partly modern.

The lower town is subject to occasional inundations from the Tiber, which sometimes rises, in seasons of extraordinary rains, from 25 to 30 feet above its ordinary level, whilst a considerable part of the town is hardly 20 feet above the level.

The dense population of ancient Rome and the elevated position of the old city, with the plentiful supply of wholesome water, the convenience of sewers, and other circumstances, contributed to maintain a tolerable state of salubrity within the walls.

Cicero remarks on the good choice of those who built Rome in the most favourable spot in the midst of a generally unhealthy region. ('De Republ.,' ii. 6.) Horace however ('Epist.' i. 7) complains of the fevers which prevailed in the month of August. The improvements made by Augustus, and the reconstruction of the town after the great fire in Nero's time, seem to have had a good effect on the salubriousness of the city, and Frontinus (i. 18) observes that the increased supply of water by means of additional aqueducts had contributed to render the atmosphere purer than it was in the old times. But still the unhealthiness of the old city was and is much less in degree than that of the country without the walls, and especially of the lowlands towards the sea-coast. There are families and whole religious communities that live all the year round on the desolate hills of old Rome without any remarkable inconvenience, though no one would venture to spend the summer months, at least from choice, outside of the walls between Rome and the sea. The miasmata which produce the malaria, emanate from the volcanic soil of the Campagna acted upon by the rays of a burning sun; they seem to be of a dense heavy nature, seldom rising very high above the ground, unless wafted by the winds. Walls appear to stop their advance, fire dispels them, house foundations and pavements prevent their emanation. For an investigation of this curious subject see Brocchi, 'Stato Fisico del Suolo di Roma;' Tournon, 'Études Statistiques sur Rome,' and an article on Tournon's book, in the 'Foreign Quarterly Review,' xxi., Jan., 1833.

It seems now proved that whenever the population has decreased within Rome, from political and other causes, the air has become less wholesome, and that the thinly-inhabited districts are, independently of their situation, unwholesome in summer, when compared with the more populous parts of the town. Thus the neighbourhood of the Corso and the lower town in general, and even the low filthy quarter of the Jews, are salubrious, whilst the eastern part of the fine street of Porta Pia, the neighbourhood of Santa Maria Maggiore and that of the Lateran, are considered unhealthy in summer, although they are on comparatively high ground. The parts of the Quirinal and the Pincian which are built upon are the most desirable situations in modern Rome for fresh air and health. On the other side of the river, the thinly-built district of La Lungara and the Vatican are considered unhealthy in summer, whilst the densely-peopled part of Transtevere is less complained of.

The temperature of Rome is generally mild; frosts occur in January; but the thermometer seldom descends lower than 26° of Fahrenheit, and the midday sun generally produces a thaw. The tramontana, or north wind, sometimes however blows cold and piercing for days together. Snow falls at times, but it seldom remains on the ground for more than a day. Orange trees thrive in the open air, but lemon trees require covering during the winter months. Rains are frequent and heavy in November and December, but fogs are rare. In the summer months the heat is at times oppressive, especially when the scirocco, or south wind, blows. The hour which follows sunset is considered the most unwholesome in summer, and people avoid exposure to the open air.

The sky of Rome has been admired for its soft transparent light, its ultramarine blue tinge, and the splendid colours of the sunset, which Claude has so well imitated. Within the walls of Rome there are many fine points of view. From the

tower of the Senatorial Palace on the Capitol there is a good panorama of Rome, embracing both the old and new towns; from the terrace of La Trinità de' Monti is a fine western view of modern Rome; there is another view from the Janiculus, in an opposite or eastern direction; and lastly, from the gallery above St. Peter's dome is a splendid and extensive panorama, embracing the whole town, the Campagna, the distant mountains, and the long line of the blue sea.

For the better understanding of the topography of Rome, the large map of Nolli, the atlas which accompanies Bunsen's 'Beschreibung der Stadt Rom,' or the small map by the Society for the Diffusion of Useful Knowledge, may be consulted. The map in Brocchi's work above mentioned gives a good idea of the surface of the ground. The article Rome in the 'Penny Cyclopædia' contains a Table of some of the more remarkable modern buildings in Rome, in chronological order.

The ancient remains of Rome have been examined with great industry by modern scholars and antiquarians. Many difficulties have been cleared up; but some still remain. The remains are of various kinds. Ancient Rome abounded in public baths. There are remains of the baths of Trajan, of Diocletian, and of Caracalla; those of Caracalla are extensive, but they are now merely a mass of walls. There are remains of numerous temples, but most of them are insignificant. The temple of Fortuna Virilis still exists, and there are remains of a temple of Bacchus, of Vesta in the Forum Boarium, of Fortune, or of the Vespasiani, as Bunsen supposes; of Jupiter Tonans, or of Saturn, as Bunsen calls it, on the Mons Capitolinus, and some others. The PANTHEON is described under that article. Of the remains of the ancient gates, those at the gate now called Porta Maggiore are the most considerable. Here are the ancient gates of the Via Labicana and Via Prænestina, formed by the monument of the Claudian aqueduct. The magnificence of these gateways was owing, in a great measure perhaps, to the circumstance of the Claudian aqueduct passing over them. The three great inscriptions on the attic above the gateways show, first, that Tiberius Claudius, the emperor, brought to Rome the Claudian waters composed of the Cærulean and Curtian streams, and also the Aniene Nova. The second indicates the restoration by Vespasian; and the third, that by Titus. This magnificent façade consists of two great archways, and three piers, each decorated with two rusticated columns of the Corinthian order, placed on a rustic basement, and supporting an entablature and pediment. Above these is the lofty attic in which are the two water-channels. This attic is surmounted with a cornice. Severe in character, this structure is one of the best preserved, and one of the most imposing architectural masses in Rome. From this gate may be seen the four aqueducts, Julia, Tepula, Marcia, and Aniene Vetus.

Some of the tombs are interesting for their inscriptions or their historical associations. The pyramid of C. Sestius, constructed in the time of Augustus, is situated near the Porta San Paolo. The tomb of Scipio is situated in a cross road, which connects the Via Appia and the Via Latina; and the tomb of Cæcilia Metella is near the Via Appia. The mausoleum of Augustus is destroyed. In the latter part of the last century the remains of this edifice were turned into an amphitheatre for bull-fights and fire-works. The immense mausoleum of Hadrian, now the castle of Sant' Angelo, is on the right bank of the Tiber. No traces of the decoration remain. Procopius, who described it in the sixth century, before it was injured, says that it was built of Parian marble, and adorned with statues both of men and horses of the same material.

The ancient bridges have been already mentioned. There are some remains of the theatre of Marcellus, built by Augustus: they are in the Piazza Montanara. The great Flavian amphitheatre, commenced by Vespasian, is the most majestic ruin in the world. [AMPHITHEATRE.] There is a small brick amphitheatre, probably built in the first century of the Christian æra.

The triumphal arches are among the best preserved monuments of Rome. The arch of Titus stands near the ruins of the temple of Venus and Rome. On the side facing the Colosseum is a finely-cut inscription on the attic: SENATVS . POPVLVSQVE . ROMANVS . DIVO . TITO . DIVI . VESPASIANI . F . VESPASIANO . AVG. It was erected by Domitian, in honour of Titus, and to commemorate the conquest of Jerusalem. It is of Pentelic marble, and of an elegant design, but with only one arch. The arch of Septimius Severus was erected A.D. 205, by the senate and Roman people, in honour of Septimius Severus, and his sons Caracalla and Geta, for their victories over the Parthians, the Arabs, the Adiabéni, and other oriental nations. The arch of Constantine, erected in commemoration of his victory over Maxentius, fronts the Colosseum. Besides these, there is the single arch of Travertino, erected by the consuls P. Cornelius Dolabella, and C. Junius Silanus, A.D. 10; the arch of Gallienus; the arch of Drusus; and two others.

The column of M. Aurelius Antoninus stands in the Piazza Colonna. [ANTONINE COLUMN.] The column of Trajan, formed of thirty-four pieces of white marble, is in the forum of Trajan. This column is admirable both for its proportions, and for the design and execution of the bassi rilievi and ornaments.

There are some remains of the Forum of Nerva, and of the Forum of Trajan. Other remains of various kinds are described in works which specially treat of the antiquities of Rome.

The topography of ancient Rome has engaged the attention of scholars since the revival of learning; and the works on this subject are very numerous. One of the latest and most important works on the topography of Rome and its antiquities, is 'Beschreibung der Stadt Rom.,' by Platner, Bunsen, Gerhard, and Röstell, 3 vols. 8vo, with numerous maps and plans, Stuttgardt and Tübingen, 1830.

The history of Rome and of the Roman State is the history of civilisation in Western Europe. The Empire of Rome began with a

small settlement on the banks of the Tiber, and it finally embraced the principal part of the ancient world. On the ruins of this Empire rose the principal states of western Europe, whose language, literature, and law, have either their foundation in the Roman language and Roman institutions, or have been to a great extent affected by them. Nothing more can be done here than to indicate the chief periods in this important history.

Rome was founded, according to the received accounts, by Romulus, B.C. 753; and it was governed by a succession of kings to the year B.C. 510. The kings were — Romulus, 753–714; Numa Pompilius, 715–673; Tullus Hostilius, 673–641; Ancus Marcius, 641–616; L. Tarquinius, 616–578; Servius Tullius, 578–534; Tarquinius Superbus, 534–510. The early period of this history is legendary, and a large part of it uncertain, founded mainly on tradition; yet within this time were laid the foundations of the civil and religious polity of the Romans, of the senate, of the comitia, of their military system, their colonisation, and their legal institutions. At the close of the reign of Superbus, B.C. 510, Rome was mistress of nearly the whole of Latium, and of part of the Sabine territory. After the expulsion of the last king, the government was placed in the hands of two consuls, chosen annually.

A second period commences with the Republican and extends to the Dictatorship of Sulla, B.C. 82. There seems to have been little immediate change in the Roman constitution after the expulsion of Superbus; for the two consuls exercised annually the functions and the power of the kings; and the patricians or ruling class engrossed these offices, and the honours and emoluments of the state. The inferior class, called the plebeians, only obtained access to the honours of the republic after a long struggle; and the animosities of these two rival bodies were further increased by the disputes about the public lands, taken from conquered people, the enjoyment of which was in the exclusive possession of the privileged class, or of the patricians. In B.C. 494 the plebeians obtained the creation of two, or, according to other accounts, five magistrates, called Tribunes of the Plebs, to protect their order; and two other plebeian magistrates, called Ædiles; and no long time after (B.C. 471) the plebeians obtained the sole right of choosing their own magistrates without the confirmation of the Comitia curiata, or the patrician body; and to make enactments (plebiscita) of their own authority. In B.C. 451 the Laws of the Twelve Tables were formed. [Roman Law.] This legislation was the foundation of the Roman system of law, public and private, which was afterwards developed.

The next great change was the admission of the plebeians to the consulship, B.C. 366. The other great civil and religious offices were gradually opened to the plebeians; the dictatorship in B.C. 356, the censorship in B.C. 351, the prætorship in B.C. 336, and in B.C. 300 the offices of pontifex and augur. The struggle of the patricians and plebeians is one of the most instructive histories on record, though unfortunately the extant authorities have left many important events in great obscurity.

In the midst of her internal struggles Rome never ceased to extend her power over Italy by conquests and colonies. [Colonies.] The war with King Pyrrhus and the Tarentines [Pyrrhus] ended in making the Romans masters of the southern part of the peninsula; and in B.C. 265 all Italy, from the Sicilian Straits to the Macra, a river in north Etruria, acknowledged the supremacy of Rome. The constitution, now composed of a balanced aristocracy and democracy, had obtained a firmness and consistency which gave it peace at home and power abroad; and Polybius the Greek historian, who was a witness of its working towards the end of the second Punic War, looked upon it with admiration. (Polyb. iv. 2.)

The first great war with the Carthaginians [Punic War], which commenced B.C. 264, led the Romans out of the peninsula, and they gained possession of Sicily and the adjacent islands. Sicily was the first Roman province, in the proper sense of that term. This extension of the Roman dominions to parts beyond the sea being once made, and the Romans having been compelled, in their contest with the Carthaginians, to become a naval power, the native vigour of the Roman character, their military and administrative talent, found full employment in the further extension of the Roman dominion. In B.C. 146 Carthage was destroyed, and her territory became a Roman province. There was now no power that was able to resist the victorious arms of Rome; and the conquering republic, which already had succeeded to the Carthaginian dominion in Spain, now planted her foot in Greece and in Asia Minor. But the foreign conquests of Rome had changed the character of the people. Wealth had been acquired by individuals to an enormous amount, corruption had invaded the state, and slavery had become an element of society, which in the earlier ages of Rome had certainly existed, but only in a limited degree. The poor complained that they were ground down by military service; that they had no lands to cultivate; that all was engrossed by the rich and the few. Out of these elements arose the agitation of the Gracchi [Gracchi], the civil wars of Marius and Sulla, and finally the usurpation of Sulla, who became dictator B.C. 82, and attempted to give the constitution new life by strengthening the aristocratic influence: but the times were changed; the aristocratical government of Rome was no longer practicable; there were no materials for forming a democracy, such as modern times have seen in the United States of North America. The only thing possible was a monarchical system in substance, though at first not in name.

This third period contains the termination of the eventful drama which followed the death of Sulla B.C. 78. It is the period for which we have more abundant materials than for any other portion of Roman history, for it was the period of the great literary activity of Cicero, and other Roman writers. The conquests of C. Julius Cæsar in Gaul between B.C. 58 and B.C. 50 pre-

pared the way for his usurpation of the supreme power under the name of a dictatorship. His assassination by a faction in B.C. 44 brought a new actor on the stage, his great nephew C. Octavius, who under the name of Augustus founded the imperial system, which was developed under a long line of successors, whom we call the Emperors of Rome. C. Octavius, who took the name of C. Julius Cæsar Octavianus, on the death of the dictator Cæsar, obtained the sole power by the defeat of his rival, M. Antonius, at the battle of Actium B.C. 30.

The imperial period may be considered to commence B.C. 30, though it would be a great mistake to suppose that Augustus all at once established an imperial power such as was exercised by his later successors. In form Rome was what it had been before. The senate retained its functions, and the popular assemblies still met. Under Tiberius the comitia for the election of magistrates no longer existed; the elections were transferred to the senate. The legislative power of the comitia was occasionally exercised, as it appears, even after the reign of Tiberius; but it fell into disuse, and new laws were either enacted by the senate, or proceeded from the sole pleasure of the chief of the state, the princeps, or, as we are accustomed to call him, the Emperor. The Empire consisted of two distinct parts, Italy and the Provinces. The Provinces comprehended the foreign possessions of Rome, which in their utmost limits extended from the Straits of Gibraltar to the Euphrates, from the mountains of Caledonia, the banks of the Rhine and the Danube, to the border of the Great African Desert, and to the first cataracts of the Nile.

The chronological series of the Roman emperors of the west extends from Augustus, B.C. 30, to Romulus Augustulus, A.D. 476.

The foundation of Constantinople by Constantine (A.D. 328) forms an important epoch in the history of the Empire. Though Constantinople had become the capital of the eastern hemisphere, it was not until after the death of the elder Theodosius (395 A.D.) that the division into the Eastern and Western Empires became permanent: the two parts however were intended to form one whole. The line of demarcation between the two empires was the Danube, from a little above Pesth, down to where it receives the Drau, then the small river Drinus (Drino), and a line drawn past the town of Scutari towards the great Syrtis, near the coast of Cyrenaica. All the countries east of this line belonged to the Eastern Empire, and those west of it to the Western Empire. The capitals, Rome and Constantinople, had each its senate, with equal privileges; but the bond of union between the two empires was weakened by the course of events, and they soon began to feel jealous of each other. The Emperors of the East contrived to avert the invasions of the barbarians, and to turn their attention to the West, which, being also more exposed to such invasions, was destined to fall first; the Eastern Empire, which had the advantage of a more favourable position for its capital and had also greater means and better armies, prolonged its existence for many centuries. And even after it had lost all its provinces, and was confined to a very narrow space, it nevertheless maintained itself until the year 1453 A.D., when Constantinople was taken by the Turks under Mohammed II.

After the death of Valentinian III., A.D. 455, there was a succession of emperors on the throne of the West, who were puppets, until A.D. 476, when Odoacer, a Goth, assumed the government of Italy, and fixed his residence at Ravenna. He did not take the name of king, but professed to administer the affairs of Italy in the name of Zeno, Emperor of the East. In A.D. 493 Theodoric, a chief of the Ostrogoths, deprived Odoacer of his power, put him to death, and Theodoric became king of Italy. This was the beginning of the Gothic dynasty in Italy, which lasted under Theodoric and his successors until the kingdom of Italy was recovered by the Emperor Justinian and his general Narses, who was sent there in A.D. 552, and defeated King Totila. From this time Rome and Italy were under the government of Exarchs, who resided at Ravenna. The Longobards, or Lombards, were now settled in Italy; and though they never got possession of all the peninsula, like the Goths, they were a formidable nation; and during the two centuries that their power lasted, they attacked Rome several times, but unsuccessfully. In A.D. 774 Desiderius, the last Lombard king, surrendered to Charlemagne, and the kingdom of Italy passed under the dominion of the Franks. Before the overthrow of Desiderius, the dominion of the Exarchs had been reduced to insignificant limits by the encroachments of the Lombard kings; and Pepin, the father of Charlemagne, had given the exarchate, with Ravenna, to the see of Rome. Charlemagne confirmed Pepin's gift, and Pope Leo III. crowned him at Rome as Emperor of the West. Rome was under the Carlovingian dynasty until A.D. 888. From A.D. 888 to 961 the succession to the kingdom of Italy was disputed. On the deposition of Charles the Fat in A.D. 887, the last emperor of the Carlovingian dynasty, there were several competitors for the possession of Italy, and a period of anarchy followed. In A.D. 961, Otho I., the German, was crowned King of Italy at Milan, and afterwards as Emperor at Rome by Pope John XII. He swore to respect the authority of the Roman See, and not to encroach upon its temporal power and possessions. He was acknowledged as Emperor, and his son as King by the Romans, but the Pope remained lord of the Roman duchy as an imperial feudatory, just as in the time of Charlemagne. Rome continued to pay allegiance, real or nominal, to the kings of Germany and Italy from A.D. 961 to 1278. In 1277 Cardinal Orsini being elected Pope, and having assumed the name of Nicholas III., applied to Rudolph of Hapsburg, king of Germany, to define by charter the States of the Church, and separate them for ever from those dependent on the Empire. He sent him at the same time copies of the former charters of donation, real or supposed, of his imperial predecessors. Rudolph, engrossed with German affairs, and

little acquainted with those of Italy, wishing also to oblige the pope, from whom he expected the Imperial crown, defined by letters patent, dated May, 1278, the States of the Church as extending from Radicofani to Ceprano on the frontiers of Naples, and from the Mediterranean to the Adriatic, including the former duchy of Spoleto, the March of Ancona, and the Romagna. He released the people of all those places from their oath of allegiance to the Empire, giving up all rights over them which might still be vested in the Imperial crown, and acknowledging the sovereignty of the same to belong to the See of Rome. This important document, which is found in Raynaldus ('Annales'), was confirmed by the electors and princes of the Empire. Thus ended the former Imperial authority over Rome and its territory, and since that time Rome and the States of the Church have been governed by the Popes.

ROME. [New York.]

ROME-DE-TARN, ST. [Aveyron.]

RÖMER, OLAUS, a Danish astronomer, was born at Aarhus in Jutland, in 1644, of parents who, in order to give their son the benefits of a scientific education, sent him to the university of Copenhagen, where he applied himself diligently to the study of astronomy under Erasmus Bartholinus.

The French astronomer Picard, being at Copenhagen on a particular mission, engaged him to visit Paris, where, in 1672, he was presented to the king. In consequence of this introduction, Römer was appointed to instruct the Dauphin in mathematics, a pension was settled on him, and the next year the Royal Academy of Sciences made him a member of their body.

While in France, Römer was employed, together with MM. Cassini and Picard, in performing geodetical operations for the survey of the kingdom; he also assisted at the Royal Observatory at Paris, and, while so engaged, he observed certain inequalities in the times at which the eclipses of Jupiter's first satellite appear to take place. From these inequalities (and similar inequalities are now well known to take place in the times of the eclipses of the other satellites of that planet) the velocity of light was discovered. The discovery is almost universally ascribed to Römer, but there is some doubt whether or not M. Cassini may not be entitled to some share of the honour due to it.

Römer was as good a mechanician as an astronomer. It is to him we owe the application of the epicycloidal curve in the formation of the teeth of wheels, by which the movement is rendered uniform. He first used a transit telescope, with a clock, for observing the right ascensions of celestial bodies; and a mural quadrant for declinations.

Having remained ten years in France, Römer returned to Copenhagen, where the king, Christian V., made him professor of astronomy; he was afterwards named chancellor of the Danish exchequer, and assessor of the supreme tribunal of justice. At length, under Frederic IV., he became burgomaster of Copenhagen, in which city he died, Sept. 19, 1702.

ROMFORD. [Essex.]

ROMILLY, SIR SAMUEL, was born in London, March 1, 1757. His grandfather was a French Protestant, who had quitted France in consequence of the Edict of Nantes, and established himself as a wax-bleacher near London. His youngest son, Peter, the father of Sir Samuel Romilly, was brought up to the trade of a jeweller. The early education of Samuel Romilly, the youngest of three children, was extremely defective. After the failure of several schemes for settling him in life, he was placed in his father's trade. This he found uncongenial; but during his intervals of leisure, he applied himself assiduously to literary studies. When he was between fifteen and sixteen years of age, he commenced the Latin language, in which by means of hard study, and with the assistance of a master, he acquired great proficiency. Though he had not the opportunity of becoming a scholar in the academical sense of the term, he contrived by his perseverance and unaided efforts to refine his taste, and to lay up in his mind a large store of elegant and useful knowledge.

Samuel, evincing more and more disinclination for business, his indulgent father articled him for five years to one of the sworn clerks in chancery. In May, 1778, he entered himself at Gray's Inn, and placed himself in the chambers of an equity draughtsman.

Not long after he had thus commenced his legal studies he was attacked by serious illness. Fortunately a family incident induced him to undertake a journey to Switzerland, where he remained several weeks, and, returning by way of Paris, he became acquainted in that capital with D'Alembert and Diderot, and formed intimate friendships with several of the most eminent political philosophers of that day, whose conversation and correspondence produced a marked effect upon his character and opinions. He arrived in London after an absence of several months, with his health entirely restored.

In Easter Term, 1783, Romilly was called to the bar. In Michaelmas Term, he began his attendance upon the courts, and opened his practice with a very inconsiderable amount of employment in drawing chancery pleadings. In the year after that in which he was called to the bar Romilly became acquainted with Mirabeau. By his means he was introduced to the late Marquis of Lansdowne, who had become desirous of his acquaintance upon learning that he was the writer of an anonymous tract, entitled 'A Fragment on the Constitutional Power and Duties of Juries.' His attention was soon after directed by that nobleman to Madan's 'Thoughts on Executive Justice,' and in answer to Madan's tract Romilly published some sensible observations in an anonymous pamphlet, probably the first occasion on which he was induced to consider with attention the principles of criminal law.

After obtaining rank in the profession as king's counsel, his business in the Court of Chancery, to which he ultimately confined his attention, rapidly increased. About 1805 the Bishop of Durham gave him the office of Chancellor of the

County Palatine of Durham, which he held for many years. In the autumn of 1805 he was offered a seat in parliament by the Prince of Wales, which he declined from the same independent feeling which had induced him to decline offers of a similar kind previously made by Lord Lansdowne.

On the formation of the Grenville administration at the commencement of 1806, Romilly received the appointment of solicitor-general, and the honour of knighthood, and was brought into parliament by the government for the borough of Queenborough. He was appointed one of the managers for the Commons, on the trial and impeachment of Lord Melville, and summed up the evidence in support of the charge. In the course of his first session in parliament he introduced a bill for the amendment of the bankrupt laws (46 Geo. III., c. 135), which passed both houses, and constituted a material improvement of that branch of the law of England. After the dissolution of parliament, at the close of 1806, he was re-elected for the government borough of Queenborough; and in the early part of 1807 he introduced a bill for the purpose of making real property in all cases assets for the payment of simple contract debts. This just and reasonable measure was rejected in the House of Commons by a considerable majority. A measure founded upon a more limited application of the same principle, was however during the next session proposed by Romilly, and carried (47 Geo. III., c. 74).

On the dissolution of parliament, which took place after the change of ministers in 1807, he purchased his return for the borough of Horsham from the Duke of Norfolk—a mode of entering the House of Commons which he characterised as 'detestable' ('Memoirs,' vol. ii. p. 201), but the only mode by which he could hope to obtain a seat in parliament consistently with entire independence of action. From this seat he was ejected on petition in 1808, but was then returned for the borough of Wareham, purchased also, at a cost of 3000*l.*

In the autumn vacation of 1807 Romilly had applied himself to the consideration of the criminal law of England, which was at that time far more severe than that of any other European country—nearly 300 crimes of various degrees and qualities of moral guilt being then indiscriminately punishable with death. The necessary consequence was a great uncertainty in the execution of criminal justice, proportionately impairing its effectiveness; for, as Lord Coke long ago observed, 'too severe laws are never duly executed' (3 'Inst.,' 163). To the removal or mitigation of this great evil Sir Samuel Romilly devoted himself with uncommon energy and perseverance, during the last ten years of his life. He however met with opposition on every side, and although several laws of a local and special nature were repealed, and a considerable effect produced on public opinion by the repeated discussions of the subject, it was not until several years after his death that any substantial improvement of the criminal law was effected.

On the dissolution of parliament at the close of 1812, Romilly, after being defeated at Bristol, was returned by the Duke of Norfolk for his borough of Arundel. Before the meeting of the new parliament, in 1813, he published a small pamphlet, entitled 'Objections to the Project of creating a Vice-Chancellor of England.' This unsatisfactory plan of reforming the evils of the Court of Chancery he in all its stages strenuously though unsuccessfully opposed.

In addition to his proposals for the improvement of the criminal law, he took an active part in all the political questions of the time, generally acting in zealous opposition to the ministers. He supported Mr. Whitebread's resolution against declaring war with France upon the return of Napoleon from Elba in 1815; he opposed the bills for suppressing Irish insurrections, and for the suspension of the Habeas Corpus Act in 1817, and moved resolutions condemning Lord Sidmouth's circular to magistrates respecting the prosecution of seditious libels. He also spoke and voted against the Alien Act, and in favour of an extension of the elective franchise, and of Roman Catholic emancipation.

In the summer of 1818 a dissolution of parliament took place, and Romilly, consenting to stand for Westminster, was returned at the head of the poll, though he declined to take any part in the canvass, and did not appear upon the hustings until the termination of the election. He died however before the meeting of parliament. Lady Romilly, to whom he was devotedly attached, died at Cowes in the Isle of Wight, Oct. 29, 1818; and this event occurring at a time when his mind was excited by recent exertions and anxiety, produced a delirium, under the influence of which he put an end to his existence, Nov. 2, 1818.

ROMNEY. [KENT.]

ROMNEY, GEORGE, born at Dalton in Lancashire, Dec. 15, 1734, was the son of John Romney, a wealthy cabinet-maker of that town. He was taken away from school in his eleventh year, and placed in his father's workshop. How Romney first manifested a talent for art is not satisfactorily shown by his several biographers; but it is certain that at the age of nineteen he was bound for four years to a portrait-painter named Steele, living at Kendal.

Here, in 1756, Romney contracted an early marriage, and having cancelled the indenture with his master at the age of twenty-three, commenced painting on his own account. His industry was indefatigable, and nature alone being his guide, he gradually formed for himself a simple and natural style. In the spring of 1762 he set out alone for London, leaving at Kendal his wife and two young children, who were never called to share his fortunes. Indeed he kept their very existence a secret from his friends.

Romney seems to have met with considerable and early encouragement. He soon moved from the city to the west end, and paid a short visit to Paris. Upon his return he painted the portrait of Sir Joseph Yates, one of the judges of the Court of King's Bench. Shortly afterwards he obtained a fifty-guinea premium from the Society of Arts for a picture of the Death of King Edmund.

In 1767 he removed to Great Newport Street. Here he added greatly to his reputation by a portrait of Sir George Warren and his Lady. He set out for Italy in 1773, with a letter of introduction to the pope from the Duke of Richmond. In Rome he paid particular attention to the works of Michel Angelo and Raphael; and during his stay there produced one of his most beautiful pictures, the Wood Nymph. From Rome he went to Venice, where he painted the portrait of Wortley Montagu in a Turkish dress. He returned to London in the summer of 1775, greatly improved in every respect by his continental tour. Shortly after he took a house in Cavendish Square, and, under the auspices of the Duke of Richmond, recommenced his career as a portrait-painter. Sitters of all ranks crowded to his studio; and, in a few years, he realised an income of near four thousand a year by portraits alone.

Romney was now in portrait-painting the acknowledged rival of Sir Joshua Reynolds. Notwithstanding Romney's great employment in portraiture, he found leisure to *lay in* fancy pieces, many of which however were never finished. He is said to have been the originator of Boydell's 'Shakspere Gallery,' for which he painted the Infant Shakspere, Puck, and Prospero and Miranda from the 'Tempest.' He was an enthusiastic admirer of Lady Hamilton, then the beautiful Emma Lyon. According to his son, he made no less than twenty-three pictures from her, some of which however were never finished.

Romney's ambition appears to have increased with his years, and in his later days he devoted himself more ardently to fancy subjects than ever. Milton and his daughters, and Newton making Experiments with the Prism, as a companion to it, were the most popular of these later productions. He sent 100*l.* to Flaxman, then studying in Rome, to purchase casts from the antique for him.

But while his ambition daily grew more boundless, his faculties were rapidly declining. He left Cavendish Square in 1797, to reside at a new house with a magnificent studio, which he had caused to be built at Hampstead; but here, after one or two efforts upon the canvass, he complained of a swimming in the head, and a paralytic numbness in his right hand, and then renounced the pencil for ever.

In the summer of 1799 he started abruptly for the north, where, in Kendal, his wife still resided, surviving the long estrangement of her husband, and in whom he found an attentive and affectionate nurse, 'who had never been irritated to an act of unkindness or an expression of reproach' by thirty-seven years of absence. The kind attentions of this exemplary woman awakened feelings of intense gratitude in the heart of Romney. He sold his property at Hampstead, and purchased a house at Kendal, where he resolved to remain. But in a little more than a year afterwards he fell suddenly into a state of utter imbecility, and lingered on until November 15, 1802, when he died, in the 66th year of his age.

Romney painted the portraits of most of the principal statesmen of his time. He was not a member of the Royal Academy, nor were any of his works exhibited there. Some of his poetical designs were presented in 1817, by the painter's son, to the university of Cambridge, to be deposited in the Fitzwilliam Museum; and the Cartoons, so much admired by Flaxman, were by the same gentleman presented, in 1823, to the Royal Institution of Liverpool.

ROMORANTIN. [Loire-et-Cher.]

ROMSEY. [Hampshire.]

RO'MULUS. One legend represents Romulus as connected with the royal family of Alba, and this was the story that was generally received by the Romans. The second, which connects Romulus with Æneas and the Trojans, did not become current until a comparatively late period of the history of Rome. The main features of the genuine Roman legend as preserved in Livy and other writers (i. 3, &c.; Cic., 'De Republ.,' ii. 5; comp. Plut., 'Romul.,' 3, &c; Dionys. Hal., i., p. 61, &c.), are these:—

When Procas, king of Alba, died, he left two sons, Númitor, and Amulius, who wrested the government from his elder brother. Amulius, fearing the descendants of his brother, had the son of Numitor murdered, and made his daughter Silvia a priestess of Vesta, an office which obliged her to perpetual celibacy. But she became a mother by the god Mars, and brought forth twin sons, Romulus and Remus. Amulius put the mother to death, and ordered the children to be drowned in the Anio. But the stream carried the cradle, in which the children had been placed, into the Tiber, which had overflowed its banks. The cradle was driven into shallow water to a wild fig-tree (Ficus Ruminalis) at the foot of the Palatine hill. A she-wolf heard the cries of the children, and suckled them, and a woodpecker, which was, like the wolf, an animal sacred to Mars, brought them food. Faustulus, the herdsman of the flocks of king Amulius, found the children and carried them to his wife Acca Laurentia or Lupa. Thus they grew up in the shepherd's straw huts on the Palatine. The two youths became the stoutest and bravest among their comrades, with whom they shared their booty. A quarrel one day broke out between the two brothers and the shepherds of Numitor. Remus was taken by a stratagem, and led to Alba before Numitor, who, struck by his appearance and the circumstances of the age of the two brothers, ordered Romulus likewise to be brought before him. Faustulus now disclosed to the young men the secret of their birth, and with the assistance of the faithful comrades who had accompanied them to Alba, they slew Amulius, and their grandfather Numitor, who was still living, was restored to the government of Alba.

The youths resolving to found a new city on the Tiber, and on the spot of their miraculous preservation, Numitor assigned them a district extending in the direction of Alba as far as the sixth milestone, which was the frontier of the original *Ager Romanus*, or Roman territory. A dispute arising between the brothers as to the site and name of the new city, it was agreed that it should be decided by augury. Romulus took his station on the Palatine, and Remus on the

Aventine. Remus had the first augury, and saw six vultures, but Romulus saw twelve, and his party claimed the victory. In observance of the rites customary among the Etruscans in the building of towns, Romulus yoked a bullock and a heifer to a plough and drew a furrow round the foot of the Palatine Hill, to mark the course of the walls and of the pomerium. Over the parts where he intended to build the gates (*portæ*) he carried the plough. The new city thus built on the Palatine was called Roma. Remus, in order to show his contempt of the rude and simple fortifications, leaped over them; and Romulus punished his insolence by putting him to death.

The population of the new city being very small, the gates were thrown open to strangers. Exiles, robbers, runaway slaves, and criminals, flocked to the city as an asylum, and found a reception. The only thing they now wanted was women; but none of the neighbouring people were willing to form matrimonial connections with the new settlers. Romulus therefore had recourse to a stratagem; he proclaimed that festive solemnities and games should be held in the city, and he invited his neighbours the Latins and Sabines to attend them with their daughters. In the midst of the solemnities some females were forcibly carried off. The three nearest Latin towns, Antemnæ, Cænina, and Crustumerium, now took up arms against Rome, but Romulus defeated them successively, and having slain Acron, king of Cænina, he dedicated the first *spolia opima* to Jupiter Feretrius. The Sabines, under their king Titus Tatius, likewise made war upon Rome, and the treachery of Tarpeia, a Roman woman, opened to them the gates of the fortress on the Capitol. The Sabines attempted to storm the city, and Romulus in this emergency vowed a temple to Jupiter Stator, in order to inspire his men with courage. The war was continued with doubtful success, and finally terminated by the Sabine women throwing themselves between the combatants, and thus restoring peace between their fathers and husbands. Romulus rewarded the women of Rome for their services by the grant of various privileges, and the thirty curiæ were called after the names of the thirty Sabine women. The two nations, the Romans on the Palatine, and the Sabines on the Capitoline and the Quirinal, were united as one nation, though each continued to have its own king.

The two kings and the citizens of the two states met in the valley between the Capitoline and Palatine (*comitium*), whenever it was necessary to transact business which was of importance to both nations. Tatius was killed during a national sacrifice at Lavinium, and Romulus henceforth ruled alone over the two nations.

Such are the fortunes and achievements which the old Roman legend ascribed to the founder of the city. He is said to have been taken up to heaven after a reign of thirty-seven years (716 B.C.). The main features of the story were handed down by tradition, and commemorated in national songs to the time of Dionysius. (Dionys. Hal., i., p. 66.)

RONCESVALLES. [NAVARRA; PYRE'NE'ES, BASSES.]

RONDA, a city in the south of Spain, was built by the Moors, with the remains of Acinippo, or Ronda-la-Vieja, which is two leagues to the north, and where the ruins of an amphitheatre, a temple, aqueduct, and extensive walls, are still standing. Ronda is situated in the midst of the lofty mountains of the Sierra-de-Ronda; it is 76 miles S.W. from Granada, and has about 18,000 inhabitants. The city is separated into two parts by a very narrow ravine of great depth, traversed by the Guadiaro, which is crossed by two bridges. One of these bridges is a work of great boldness, springing from the banks of the river on massive stone piers, at the height of nearly 400 feet above the bed of the river. The streets of the town are narrow, but clean. The Alameda is well shaded with trees and shrubs; the Plaza-de-Toros is built entirely of stone, and capable of holding 9000 persons. The Alcazar, or castle, taken from the Moors by Ferdinand in 1485, and formerly one of the most extensive fortresses in all Andalucia, is now a mass of ruins, having been blown up by the French on their evacuation of Ronda during the Peninsular war. With the exception of a few tan-yards, Ronda has no trade whatever; the inhabitants occupy themselves chiefly in farming and raising fruits and vegetables for the consumption of Gibraltar, distant about 48 miles. An annual fair, originally instituted for the sale of horses, but which now is not confined to that traffic, is held at Ronda. It is attended by merchants from almost every part of southern Spain.

RONDEAU (Fr.), or RONDO (It.), a kind of air, consisting of two or more strains, in which, after finishing the second strain, the first is repeated, and again after the third, &c., always returning to and concluding with the first.

RONDELE'TIA, a genus of plants of the natural family of *Rubiaceæ*. The genus, as formerly constituted, included many shrubby trees which occur in India (Roxb., 'Fl. Indica'), but these have been referred by modern botanists to other genera. The present genus *Rondeletia* occurs chiefly in America and the West Indies.

RONSA'RD, PIERRE DE, born in 1524, in the district of France called Vendômois, was the son of a maître-d'hôtel of Francis I., who made him a knight. Pierre entered the service of the Duke of Orléans, son of Francis I., in the quality of page. He afterwards attended, in the same capacity, James Stuart, King of Scotland, who had come to Paris to marry Marie de Lorraine, and he accompanied James on his return to Scotland, where he remained three years. On his return to France he resumed his post with the Duke of Orléans, who sent him on several missions to Scotland, Ireland, and other countries. On withdrawing from active life he retired to the college of Coqueret, where he studied the classics under Turnèbe, became a good Greek scholar, and took orders as a priest. He also began writing French poems, and was crowned in the floral games at Toulouse. Montaigne and others commend him highly. Boileau says that his language was a

compound of various languages and dialects, and that his muse spoke Greek and Latin in French verses. Charles IX. bestowed on Ronsard an abbacy and other benefices. He died in 1585. His poetical works are numerous; they consist of odes, hymns, eclogues, &c.: 'Mascarades, Combats, et Cartels fait à Paris et au Carnaval de Fontainbleau.' He also began a poem, 'La Franciade,' which he left unfinished. The most complete edition of his works is that by Richelet, 2 vols. folio, Paris, 1623.

RONSDORF. [DÜSSELDORF.]

ROOD. [ACRE.]

ROOF, the covering of a house or other building. The name, in its most extended sense, embraces the external covering itself, and the framework by which it is supported; but as a term in carpentry, it is limited to the carcass roof or framing.

In order to cover in a building in which the space to be spanned is greater than can be covered by single blocks of stone extending from one point of support to another, it is necessary either to have recourse to the principle of the arch, as in vaults and domes of stone or brick, or to form a framework of timber to support the covering. [ARCH; DOME.] Roofs formed of one level plane, which are extensively used in eastern countries, are not adapted for our climate; and a single inclined plane carries up the roof to too great a height.

The best figure for a simple roof is that formed of two inclined planes, rising from the two opposite walls that approach nearest to each other, and meeting over the centre of the edifice, so as to form a ridge: this is called a *common* or *gable-ended* roof. Frequently four inclined planes are used, disposed as a *hipped roof*, which takes its name from the hips, or inclined ridges formed by the meeting of the sides and ends. Sometimes the inclined faces are not continued upwards till they meet, but the roof is completed by a horizontal plane. Such a roof is called a *truncated, terrace,* or *cut roof*, and may have two, three, or four inclined faces. A similar saving of height is frequently obtained by means of a roof in which each sloping face consists of two planes of different degrees of inclination. This form, which is denominated a *curb roof* (or, from its inventor, a *Mansarde roof*), is very common in London, because it affords more space for the formation of bedrooms in the roof than the simpler forms.

Such are the principal forms of roof used in covering simple rectangular buildings, but they require many modifications to suit irregularities of shape, or combinations of rectangular forms. Thus, in the junction of different roofs or portions of roofing at right angles with each other, there are inclined lines or *valleys*, which, at the junction of two planes, form hollows the reverse of hips. When two faces of a roof join, so as to form an angle similar to a valley, but in an horizontal instead of an inclined position, the term *gutter* is applied instead of valley. A further distinction is that between roofs with dripping eaves, and those in which the water is collected in gutters. In the former case the roof projects several inches, or even feet, beyond the walls, and the water running from the roof either drops at once on the ground, or is collected in troughs fixed under the margin of the eaves, and conducted by them to descending pipes. In gutter roofs the timbers do not extend to the outside of the walls, which are carried up as parapets, of a reduced thickness, to such a height as to conceal the roof either wholly or partially. The gutters, which are troughs of wood, covered with lead or other metal, are laid at the bottom of the slopes, just within the parapets, and have a gentle inclination (usually about an inch in ten feet), to cause water to run freely towards the pipes.

The degree of slope given to the inclined faces of a roof varies according to the covering material employed, as well as to the climate. The ancient Grecian temples had very low, or pediment roofs, varying from about 12° to about 16°, the height being from one-ninth to one-seventh of the span. In Roman buildings the inclination is somewhat greater, being usually 23° or 24°, or from one-fifth to two-ninths of the span. The general introduction of the pointed style of architecture led to the use of very high pitched roofs, a very common proportion being that in which the length of the rafters is the same as the span, so that they formed an equilateral triangle. In comparatively modern domestic architecture, in this country, it has been considered desirable for the length of the rafters to be three-fourths that of the span, and an angle of 45° is still considered by some to be the best pitch when plain tiles are used. The following table, extracted from Tredgold's 'Elementary Principles of Carpentry,' shows the proper angle for roofs covered with the materials specified in the first column, the last column indicating the comparative weight in lbs. of each kind of covering:—

Covering.	Inclination to the horizon.	Weight upon a square (100 sq. feet) of roofing.
Copper or Lead...	3° 50′	copper 100 lead 700
Slates, large	22°	1120
Slates, ordinary...	26° 33′	900 to 500
Stone Slate	29° 41′	2380
Plain Tiles	29° 51′	1780
Pan-Tiles.....	24°	650
Thatch of Straw, Reeds, or Heath	45°	... ...

In describing the timber-work of an ordinary roof, each of the planes of which it is composed may be considered to be bounded by a frame, the parts of which have the general name of *bordering pieces.* Those which join the wall are the *wall-plates;* that at the meeting of two faces, parallel to the wall-plates, is the *ridge-piece;* and the inclined bars extending from the wall-plates to the ridge-piece are *rafters*, those which form the salient angles in hipped roofs being distinguished as *hip-rafters.* The support necessary for the external covering is given by a series of rafters or inclined bars, extending from the wall-plate to the ridge-piece, and placed parallel and equidistant. In a hipped roof, the rafters near

the ends, being parallel with the others, are necessarily diminished in length, extending from the wall-plate to the hip-rafter instead of the ridge-piece. All such pieces, being shorter than the length between the wall-plate and the ridge-piece, are called *jack-rafters*. Additional support is supplied by horizontal rectangular bars called *purlins*, placed under the rafters in such a manner as to divide their length into two or more equal parts, the ends of the purlins being fixed to the sides of the bordering frame. The purlins are supported by a series of bars called *principals*, placed equidistant from each other, and parallel with the rafters, but with their upper face in the same plane as the lower face of the purlins. Where principals are used, their lower ends are mortised into the ends of the *tie-beam*, which stretches across the building, and rests upon the wall-plates. The triangular frame formed by the two principals and a tie-beam, with any bars it may comprise for additional strength, is called a *truss*, and such frames being placed at regular intervals, the timber-work between any two of them is called a *bay of roofing*. The lower extremities of the common rafters, being elevated by this arrangement above the wall-plates, are supported by *pole-plates*, or pieces of timber parallel to the wall-plates, resting on the ends of the tie-beams. The supporting frame-work altogether is called a *carcass-roof*.

In a roof consisting simply of two inclined planes abutting on the walls, it is evident that the weight of the rafters, as well as that of the covering sustained by them, will have a tendency to thrust out the walls. This tendency ordinary walls have not the strength to resist; and therefore it becomes necessary to add a horizontal *tie-beam*, which, by receiving the outward thrust of the rafters, relieves the walls of lateral strain. As the materials are not perfectly rigid, it becomes necessary, when the timbers are of considerable length, to provide means for counteracting their tendency to sinking, or *sagging*; and this is effected by adding a vertical bar called the *king-post*, by which the centre of the tie-beam may be suspended from the crown of the roof. Sometimes the king-post is dispensed with, and its office performed by two similar posts, called *queen-posts*, at equal distances from the centre of the truss. In order to keep these in their right position, a short horizontal beam, called a *collar-beam*, is inserted between their upper extremities, and another, termed a *straining-sill*, between their lower ends. *Cushion rafters* are pieces occasionally added, in large roofs, to strengthen the principals. In curb roofs the upper rows of rafters are called *curb-rafters*, and the horizontal bars that receive the upper ends of the lower rafters, and the feet of the curb-rafters, are known as *curb-plates*.

In roofs of very large span it is often desirable, in order to avoid running up to a great height, to form two or more ridges. When intermediate support can be obtained from partition walls, such constructions may be regarded as combinations of two or more distinct roofs placed side by side. It is sometimes necessary, in order to obtain additional height inside a building, to raise the tie-beam above the level of the top of the walls. In small spans this may be done by the simple arrangement called the *carpenter's boast*, in which a firm union is effected between the beam and the rafters without the use of nails or pins. Roofs without ties may be greatly strengthened by the use of parabolic curves of iron, notched into the rafters of each inclined face, and abutting on the wall-plates, which in such a case are firmly bolted together. The timbers of such a roof may be framed together in planes, each having a distinct ridge-piece, and the ridges being screwed or otherwise firmly connected together. For small roofs timbers may be bent into the required form, as it is found that a piece of wood the thickness of which does not exceed $\frac{1}{120}$th part of its length, may be bent into a curve rising one-eighth of its span without impairing its elasticity. This principle of construction, with an arc composed of several pieces of timber, was followed in one of the largest roofs ever built, that erected in 1791 over a riding-house at Moscow. The span of this roof is stated by Tredgold at 235 feet, the slope being about 19°, and the external dimensions of the building 1920 by 310 feet.

Wrought-iron straps of various forms are very useful, when judiciously applied, in strengthening the joints of a roof. Tie-beams are often suspended to the trussing-posts by means of straps, so arranged as to allow the beam to be keyed up to its true position in case of the roof sinking. When this is not the case, the ties are sometimes drawn up into a slightly convex or cambered form, to meet the same contingency. Height may be gained inside a building by so disposing the timbers that the want of a continuous tie-beam may be compensated for by an iron strap to unite the ties to the bottom of the king-post. In roofing a church with a nave and side aisles, the continuity of the tie-beams may be dispensed with, intermediate support being obtained from columns. Many of the high-pitched roofs of old gothic churches and halls are very ingeniously contrived, but they often throw great pressure on the walls, owing to the absence or elevated position of the ties; thereby rendering very solid walls and buttresses necessary. The *Norman roof* is an ingenious contrivance for the construction of roofs of large span with small pieces of wood; in this arrangement all the rafters abut on joggled king-posts, of which there are several, their relative position being maintained by diagonal braces. The timbers of this kind of roof are often left visible, being so carved as to have an ornamental effect. Such a roof may be made to exert very little injurious pressure on the walls.

The nearer a roof approaches to a circle in plan, the stronger it will be, the parts deriving that mutual support from each other which forms the distinguishing character of the dome. Domes of wood, of great size, have been made without trussing, simply by forming the timbers into curved ribs abutting on the wall-plates, which then form a circle, and are kept in their proper positions by horizontal circles framed with them at intervals. The wooden dome formerly ex-

isting at the Halle aux Blés, at Paris, was a remarkably bold example of this kind, being 200 feet in diameter, and having a large opening in the centre. When the roof approaches the circular form, but not sufficiently to have the character of a dome, it may be considered as consisting of several trusses resembling those of an ordinary roof, but so contrived as to intersect each other in the centre; the king-post being common to all the trusses.

For the strength of different materials, see MATERIALS, STRENGTH OF. Cast-iron is not much used, except in fire-proof roofs, and each piece requires to be well tested. Wrought-iron is very useful for straps and fastenings, and also for ties and trussing-posts. Though iron is far stronger for its size than any kind of timber, it is neither so strong nor so cheap as yellow fir, *weight for weight.*

The joints in the frame-work of a timber roof are of various kinds, according to the nature of the strain they have to resist, and to such probable changes of form as all constructions of timber are liable to from shrinking and warping. All the timbers of a roof are usually fitted and framed together on the ground, and taken to pieces again before being elevated to the building.

Thatch is a warm covering for roofs, but harbours vermin. Tiles admit heat and moisture more than good slates. Pan-Tiles, having no holes for nailing through, are simply hung, by ledges, upon laths nailed to the rafters. Plain Tiles, laid in mortar, and over-lapping, so as to be double thickness everywhere, make a very good though heavy covering. Slates form the most usual covering in modern houses, and are laid in various ways. In some districts laminæ of stone are used in lieu of slates or tiles. Shingles, which are like slates, but made of wood, are usually laid on boarding, in a similar manner to common slates. Sheet metal is useful for curved or flat roofs. Lead is the most common material for such purposes, though copper, iron, tinned iron, and recently zinc, are also used. Lead terraces or flats are commonly laid on boarding or plaster. Various kinds of cement have also been used as coverings for roofs.

ROOK (*Corvus frugilegus*, Linn.). This well-known gregarious and familiar bird (for it seems to affect the neighbourhood of man, and even not to be scared by the smoky atmosphere of great towns,) is the *Cornacchia nera* and *Cornacchione* of the Italians; *Graye*, *Grolle*, *Freux*, and *Frayonne* of the French; *Corneille Moissoneuse* of Brisson; and *Schwartze Krähe* of the Germans.

Geographical Distribution. — The Rook is spread over the greater part of Europe; but nowhere does it seem to be more abundant than in Great Britain and Ireland. Wooded and cultivated districts are its favourite haunts. The farther north the observer goes in Scotland, the fewer rooks does he see. In Orkney and Shetland there are none, nor are there any in Guernsey and Jersey. They do not appear to be numerous in Denmark, nor in the southern districts of Sweden, nor in Russia and northern Asia, though they may be seen there. In Italy the Rook is common and permanent; but it appears to be migratory over a part of the continent of Europe. In France it is also common. It occurs between the Black and Caspian seas; and Dr. Von Siebold and M. Bürger note it among the European birds seen by them in Japan.

Food, Habits, &c.—Grain, and insects especially form the food of the Rook, and there can be no doubt that it amply repays the farmer for the seed which it takes, by its assiduity in clearing his land of wire-worms and the larvæ of the cock-chaffer (*Melolontha vulgaris*). These last are called Rook-Worms in many places, and the birds may be seen following the plough-tail to gather them up as the share exposes them. In the end of May and beginning of June, when the young are able to fly and go abroad with their parents, they may often be seen among the bright green leaves of the horse-chestnut and other trees bending the branches with their weight as they assemble to pick off the cock-chaffers in the winged state. Where these birds have been inconsiderately destroyed, on account of the supposed damage which they had done, a total failure of the crops has made the farmer glad to try to get them back again. The stick-built nest contains four or five pale greenish eggs, blotched with dark greenish brown. The male is most attentive to the female while she is sitting, and feeds her assiduously; both are very industrious in supplying their young, and the skin under the tongue may at this season be often seen dilated into a kind of pouch by the collected food. During the building season they have great squabbles among themselves about their nests.

Head and Foot of Rook.

That the bare skin around the base of the beak in the Rook is produced by its habits of thrusting the bill deep into the earth in search of food, has been sufficiently proved by Mr. John Blackwall ('Researches in Zoology'). He found in specimens with deformed mandibles, that the bristly feathers which cover the nostrils were quite perfect; indeed, he observes, the fact that young Rooks exhibit no deficiency in these particuarls,

is sufficiently conclusive on this point. Pied and pure white varieties of this bird are occasionally to be met with; instances of this occurrence are recorded by Mr. Yarrell in his 'British Birds.'

ROOKE, SIR GEORGE, ADMIRAL, the eldest son of Sir William Rooke, was born at his father's seat near Canterbury, in 1650. He entered the navy as a volunteer, and at the age of thirty had attained the rank of post-captain. In 1689 he was sent with a squadron to the coast of Ireland, where his services were such as to induce William III. to promote him to the rank of rear-admiral of the red. He soon afterwards bore a part in the indecisive action between the Earl of Torrington's fleet and that of the French Admiral Tourville, off Beachy Head.

In 1692 Rooke was advanced to the rank of vice-admiral of the blue, and greatly distinguished himself in the battle off Cape La Hogue (properly La Hague) between the French fleet and the combined English and Dutch fleets; particularly by his brilliant attack upon the enemy at night, with the boats of his squadron. So well was this contrived, and so unexpectedly and suddenly executed, that though six French three-deckers were burnt that night and seven other ships of the line on the following morning, the loss of the English only amounted to ten men. For this exploit Rooke was rewarded with the rank of vice-admiral of the red, a pension of 1000*l.* a year, and the honour of knighthood.

After the peace of Ryswick in 1697, Sir George Rooke was elected member of parliament for Portsmouth; and Queen Anne, on her accession in 1702, appointed him 'vice-admiral and lieutenant of the admiralty, and also lieutenant of the fleets and seas of this kingdom.'

At the commencement of the war of the succession, Rooke, in conjunction with the Duke of Ormond, who commanded the land forces, took the town of Vigo by storm, and destroyed seventeen of the enemy's ships. In July 1704, having been joined by a reinforcement under Sir Cloudesley Shovel, he besieged Gibraltar, which was compelled to capitulate. His engagement with the French fleet off Malaga, Aug. 13, 1704, was not so decisive: the enemy contrived to get away, and the loss on both sides was very great.

Sir George Rooke on his return to England was received by Queen Anne at Windsor with great distinction, but he shortly afterwards resigned all his public employments, and passed the rest of his life at his seat of St. Lawrence, near Canterbury, where he died Jan. 4, 1709.

ROOS, PHILIP PETER, a painter commonly called *Rosa da Tivoli*, was born at Frankfort in 1655. He was instructed in painting by his father, who was in the service of the Landgrave of Hesse. The landgrave sent him to Italy, and allowed him a pension. On arriving at Rome, he studied assiduously, and acquired a great facility of hand. He chiefly painted animals; and he kept a kind of menagerie at Tivoli, where he resided, for the purpose of drawing from the life with correctness such animals as he required for his pictures. His habits were eccentric; and although he received large sums for his works, he died in poverty, at Rome, in 1705. His pictures, according to Lanzi, are to be found in the galleries of Vienna, Dresden, and other cities of Germany, besides a very large number in Italy, and many in England. He was a member of most of the principal academies of Europe.

ROOT is that part of a plant which is sent downwards into the earth, at the same time that the stem is sent upwards into the air. Every part of the plant which exists under ground is not root, as large portions of the stem itself may remain under the surface of the earth; and large buds, called bulbs, also exist under ground. These parts have been often confounded with the root. The creeping root, and some forms of the tuberous and bulbous roots of older botanical writers, are only so many different forms of the stem.

The root is distinguished by certain structural peculiarities, by which it may be easily known from the stem. First, its ramifications are irregular, not having the symmetrical form of branches, nor are they developed like branches from buds. Secondly, roots generally produce no leaf-buds. When they do appear, which occasionally occurs, they are called adventitious buds. Thirdly, roots never have leaves, scales, or other appendages, developed upon their surface. Fourthly, the cuticle of roots is never found to possess stomates, which are frequently very numerous on various parts of the stem.

The smaller divisions of roots are called *Fibrils*, which consist of a little bundle of ducts or spiral vessels, surrounded by woody fibres, lying in a mass of cellular tissue. At the apex of the fibril the cellular tissue is loose and devoid of cuticle, from which cause it absorbs more rapidly the fluid by which it is surrounded than the other parts of the root. Although the terminations of the roots cannot be considered as special organs, they have been named by De Candolle *Spongelets* or *Spongioles*, in reference to their absorbing power.

The internal structure of the root resembles that of the stem, but in Exogens the roots do not possess a central pith. The cellular tissue of many roots is exceedingly abundant, and on this account they are used as articles of diet. Their nutritive property depends on the saccharine and other secretions which are deposited in the cells of the cellular tissue. Many of these roots, by attention to their culture, may be increased in size; and the growth of esculent roots is an object of importance in the kitchen-garden.

Roots are called *annual*, *biennial*, or *perennial*, according to their duration. When a root perishes after its first year's herbage and flowering, it is annual; if after the second year's herbage and first year of flowering, it is biennial. If a root endures for many years, although its herbage may perish every year, it is perennial.

What the absorbent vessels are to the animal, the roots are to the plant, and a difference between plants and animals has been pointed out as dependent on the relative situation of their organs of absorption. The animal derives its nutriment, by means of its absorbents, from an internal

reservoir, the stomach; whilst the plant derives its nutriment from an external reservoir, the earth. The spongioles of the roots are the active agents in the absorption of nutritious matter from the soil.

Roots do not absorb everything that is presented to them. It was long ago ascertained by Davy that plants did not absorb particles of charcoal and other substances that he diffused through water. Experiments also by Meyen, Link, and others, prove that the colouring matter of various infusions is not taken up by the roots, and that when this has been supposed to have taken place, it has arisen from mistaking a deposition of the colouring matter on the outside of the tissue for an absorption into it.

When the roots of plants are placed in solutions of gum, sugar, starch, &c., they thrive if the solutions are thin; but if thick solutions of these substances be prepared, the plants die in them. Experiments of this kind were performed by Sir H. Davy, who attributed the non-absorption of the thick solution, and the death of the plant, to the blocking-up of the pores of the vegetable tissue by the thick matter. But the theory of endosmose and exosmose gives a far better explanation of these facts. [Endosmose.]

Roots have been supposed to possess the power of excreting. This view was adopted by De Candolle. It seemed to be confirmed by an experiment of Macaire's, in which, having divided the roots of a plant of *Mercurialis annua* into two parcels, he plunged the one into a glass with a solution of acetate of lead, and the other into a glass of pure water. In a short time it was found that the acetate of lead had not only been taken up by the roots from the one glass, but that it had been excreted by them into the other.

Meyen however considers the excreted matters examined by Macaire to be merely secretions resembling those which are found on various other parts of the plant. He gives numerous instances of plants secreting various matters on the surface of their stems, leaves, &c., when they have been grown in soils which are overcharged with the same substance as that which the plant has secreted. The chalk incrustations of *Chara*, and those of various *Saxifrages*, with the crystals of salt that occur on the plants on salt-plains, are given as examples.

Besides the functions of absorption and excretion, the roots serve other purposes in the economy of the plant. It is by means of the roots that a plant maintains its position in the earth; and if for the increasing nourishment of the plant an increase of the absorbing surface is required, it is no less necessary that, for the purpose of maintaining its stem erect and firm, an extension of its holdfasts should take place.

ROPE, a combination of fibres of hemp, or other material, so arranged as to form a flexible and tenacious cord or band, retaining, as far as possible, their collective strength. The name Rope is generally confined to the larger descriptions of cordage, such as exceed an inch in circumference, though the principles of formation are much the same for cordage of every size.

The first process in rope-making consists in twisting the hemp into thick threads, called *Rope-Yarns*. This process, which resembles ordinary spinning, is performed with various kinds of machinery. The common mode of spinning rope-yarns by hand is performed in the rope-ground or rope-walk, an inclosed slip of level ground sometimes 600 feet or more in length. At one end of this ground a spinning-wheel is set up, which gives motion by a band to several small rollers or *Whirls*. Each whirl has a small hook formed on the end of its axis next the walk. Each of the spinners is provided with a bundle of dressed hemp, laid round his waist, with the bight or double in front, and the ends passing each other at his back, from which he draws out a sufficient number of fibres to form a rope-yarn of the required size; and, after slightly twisting them together with his fingers, he attaches them to the hook of a whirl. The whirl being now set in motion by turning the wheel, the skein is twisted into a rope-yarn, the spinner walking backwards down the rope-walk, supporting the yarn with one hand, which is protected by a wetted piece of coarse cloth or flannel, while with the other he regulates the quantity of fibres drawn from the bundle of hemp by the revolution of the yarn. The degree of twist depends on the velocity with which the wheel is turned, combined with the retrograde pace of the spinner. When the spinner has traversed the whole length of the rope-walk (or sooner, if the yarns are not required to be so long), he calls out, and another spinner detaches the yarn from the whirl, and gives it to a person who carries it aside to a reel, while the second spinner attaches his own hemp to the whirl-hook. The hemp, being dry and elastic, would instantly untwist if the yarn were now set at liberty. The first spinner therefore keeps fast hold of it all the while that the reeler winds it up, walking slowly up the walk, so as to keep the yarn equally tight all the way. When it is all wound up, the spinner holds it until another is ready to follow it on the reel. Sometimes, instead of being wound on a reel as they are made, the yarns are laid together in large hooks attached to posts at the side of the walk until about four hundred are collected together, when they are coiled up in a *Haul*, or skein, in which state they are ready for tarring.

In some roperies machines have been introduced, especially one invented by Mr. Lang of Greenock, for spinning yarns.

The next process is warping the yarns, or stretching them to a given length, in order that they may, when formed into a strand, bear the strain equally. When the rope is to be tarred, that operation is usually performed upon the yarns immediately after their being warped, as the application of tar to the yarns previous to their combination is necessary to the complete penetration of the whole substance of the rope. The most common method of tarring the yarns is to draw them in hauls or skeins through the tar-kettle by a capstan; but sometimes the yarns are passed singly through the tar, being wound off one reel on to another, and the superfluous

tar being taken off by passing the yarn through a hole surrounded with spongy oakum.

In making large cordage, from fifteen to twenty yarns are formed into a *Strand*, and three or more such strands are afterwards combined into a rope. The twist of the strand is in an opposite direction to that of the yarns. In closing or laying the rope, three strands are stretched at length along the walk, and attached at one end to separate but contiguous hooks, and at the other to a single hook; and they are twisted together by turning the single hook in a direction contrary to that of the other three, a piece of wood called a *Top*, in the form of a truncated cone, being placed between the strands, and kept during the whole operation gently forced into the angle formed by the strands, where they are united by the closing or twisting of the rope. As the rope shortens in closing, one end only of the apparatus is fixed, the other being on a moveable sledge, whose motion up the rope-walk is capable of regulation by suitable tackle attached to it, or by loading it with weights. The top also is mounted on a sledge, for closing large cordage, and its rate of motion may be retarded, in order to give greater firmness to the twist of the rope. Ropes formed in this manner are said to be *Shroud-laid*, or *Hawser-laid*.

The largest ropes and cables, said to be *Cable-laid*, are formed by the combination of smaller ropes twisted round their common axis, just as shroud-laid ropes are composed of strands twisted round their common axis. As cable-laid ropes are harder and more compact than others, this mode of formation is adopted for ropes to be exposed to the action of water, even though their thickness may not be very great.

Ropes formed by plaiting instead of twisting are made use of for some purposes in which pliability is especially needed, they being more supple and less liable to entanglement than those of the ordinary make. Such ropes are preferred for sash-lines, clock-lines, &c., and generally where the rope has to pass over pulleys of small diameter.

Originally all the yarns (from $\frac{1}{12}$ to $\frac{1}{9}$ of an inch in thickness) composing a strand were of the same length; but Captain Huddart showed that in such an arrangement the outermost yarns must be more strained than the inner: he accordingly in 1793 patented his *register* cordage, in which the strain is equalised throughout. The same gentleman invented machinery for almost every department of rope-making.

Flat ropes, which are much used for mining purposes, are either formed of two or more small ropes placed side by side, and united by sewing, lapping, or interlacing with thread or smaller ropes, or of a number of strands of shroud-laid rope similarly united. In either case it is necessary that the component ropes or strands be alternately of a right-hand and left-hand twist, that the rope may remain in a quiescent state.

Many experiments were made by Réaumur, Knowles, and others, to test the loss of strength by the ordinary twist given to ropes. Duhamel prepared the following statement, to show the comparative strength of ropes formed of the same hemp, and the same weight per fathom, but twisted respectively to two-thirds, three-fourths, and four-fifths of the length of their component yarns:—

Degree of twist.	Weight borne in two experiments.	
$\frac{2}{3}$	4098 lbs.	4250 lbs.
$\frac{3}{4}$	4850	6753
$\frac{4}{5}$	6205	7397

The result of these experiments led Duhamel to try the practicability of making ropes without any twist, the yarns being wrapped round to keep them together. These had great strength, but very little durability. In shroud or hawser-laid ropes, the usual reduction of length by twisting is one-third; but cable-laid ropes are further shortened, so that 200 fathoms of yarn are required to make 120 fathoms of cable.

The following simple rule for calculating the strength of ropes is given by Robinson:—Multiply the circumference of the rope in inches by itself, and the fifth part of the product will express the number of tons the rope will carry. For example, if the rope be six inches in circumference, $6 \times 6 = 36$, the fifth of which is $7\frac{1}{5}$, the number of tons which such a rope will sustain. To find the weight of shroud or hawser-laid rope, multiply the circumference in inches by itself, then multiply the product by the length of the rope in fathoms, and divide by 420, the product will be the weight in cwts. Example: to find the weight of a six-inch hawser-laid rope, 120 fathoms long, $6 \times 6 = 36 \times 120 = 4320$, which, divided by 420, gives the weight of the rope, 10 cwt. 1 qr. 4 lbs. To find the weight of cable-laid cordage, multiply its circumference in inches by itself, and divide by 4. The product will be the weight, in cwts., of a cable 120 fathoms long; from which the weight of any other length may be readily reduced. Example: required the weight of a twelve-inch cable, 120 fathoms long; $12 \times 12 = 144$, divide by 4, and the product, 36, is the weight in cwts.

The tarring of ropes somewhat impairs their strength, but renders them more durable. Oils, fats, and tallow of various kinds have been occasionally used; but tar is found to be the best preservative.

Several other kinds of vegetable fibre have been made use of in the manufacture of cordage, and some appear greatly to exceed hemp in strength. The fibres of the aloe, long wool, hemp mixed with threads of caoutchouc, thongs of ox-hide, and several other substances, have been employed; but none are found to combine so many advantages as hemp.

Ropes formed of iron-wire have been, within the last few years, introduced to a considerable extent, and have been found to effect a great saving of expense from their durability and superior lightness. Ropes of twisted iron wire were used in the silver mines of the Harz Mountains twenty years ago; they were nearly equal in strength to solid iron bars of equal thickness, and equal to hempen ropes of four times their weight. Wire ropes are now made in England under many patents. They are formed in various ways, according to their intended use. For standing rigging straight untwisted wires are employed,

bound round with cloth or small hempen cordage saturated with a solution of caoutchouc, asphaltum, or other preservative from rust. Flat ropes may likewise be made of straight wires, interwoven or wrapped with hempen yarn, or sewed between canvass, &c. Other ropes are formed much in the same way as those of hemp, the wires taking the place of rope-yarns, and being twisted into strands, and combined into ropes, both hawser-laid and cable-laid. The twisting should not be so hard as in hempen cordage; and all the wires must be protected by an anti-corrosive composition, or by coating with tin, zinc, &c. It is sometimes the practice to twist wires round a core, either of wire, hemp cord, spun yarn, or other material, to form a strand; and to lay such strands round a similar core when there are more than three strands in a rope.

The annexed table, showing the comparative size and weight per fathom for equal strength, may serve to show the great superiority of wire rope over those of hemp, which they surpass even in flexibility :—

Hemp Rope.			Wire Rope.				
	Weight per fathom.			Weight per fathom.		Equal to a strain of	
Size. Inches.	lbs.	oz.	Size. Inches.	lbs.	oz.	tons.	cwts.
3	2	4	1¼	1	4	2	10
4	3	15	1½	1	9	3	10
5	6	0	1¾	1	14	6	15
6	9	0	2	2	2	8	0
7	12	3	2¼	2	9	8	11
8	14	3	2½	4	1	9	18
9	19	6	3	5	4	15	6
10	25	0	3½	7	1	24	6
11	30	0	4	11	6	29	5
12	36	8	4½	15	12	35	4

ROPES, RIGIDITY OF. [RIGIDITY OF ROPES.]

ROSA, the name of the most universally admired and cultivated genus of plants forming the type of the natural order *Rosaceæ*.

The rose was known in early times, and was as great a favourite among the nations of antiquity as it is among the moderns. The rose is found generally in almost every country of the northern hemisphere, both in the Old and New World; from Sweden to the north of Africa; from Kamtchatka to Bengal, and from Hudson's Bay to the mountains of Mexico. It is not found in South America nor in Australia.

The best arrangement of this genus is that of Dr. Lindley, in his 'Rosarum Monographia,' published in 1820. He arranges the species under eleven divisions, the first of which, including but one species, has since been made into the genus *Lowea*. We shall here give the remaining divisions, and point out the species which, on account of their ornamental flowers or uses, are most frequently cultivated.

1. *Feroces*. Of this division the Hedgehog Rose is most common. It is a beautiful plant, with fine showy crimson blossoms appearing early in the season.

2. *Bracteatæ* belong to the class of evergreen roses. *R. bracteata*, the Macartney Rose, is a native of China, and was introduced into this country by Lord Macartney. It is a handsome plant, flowering abundantly late in the season; but it is tender, and is best grown against a wall.

3. *Cinnamomeæ*, including *R. lucida*, the Bright-Leaved Rose, *R. laxa*, Loose or Spreading Carolina Rose, and *R. Carolina*, the true Carolina Rose, a native of the marshes of North America, and often found enlivening our shrubberies by its beautiful crimson blossoms when few other flowers are to be seen.

4. *Pimpinellifoliæ*, contains *R. spinosissima*, the Scotch Rose, a dwarf, compact, green bush, with creeping roots. It is found native in the mountainous districts and sea-coasts of all Europe, and also in the Caucasus. It was the only rose found by Sir W. Hooker in Iceland. A great number of varieties are found in the gardens of Britain, produced from the wild plant found in the North of England and Scotland. They produce an abundance of seed from which varieties may be easily raised. *Rosa sulphurea*, the Double Yellow Rose, is one of the most splendid plants in the genus. It has never been known to produce single flowers. Its native country is still unknown; it was procured by Clusius from some of his correspondents in the East, of whom he made inquiry concerning this plant, after having seen a model of it in some little paper gardens sent from Constantinople.

5. *Centifoliæ* comprehends those species which have ever been most interesting to the florist, as also probably those that were earliest known. Although the garden varieties of this division would probably amount to several hundred there are only three species. *Rosa centifolia*, the Hundred-Leaved Cabbage Rose, or Provence Rose, has been said to be a native of France, but this is doubtful. It has been found wild in thickets on the eastern side of the Caucasus. It is the same plant as the *R. provincialis* of Miller, under which name most of the varieties in our gardens have been propagated. Seventy or eighty varieties of this rose have been named. A botanical variety of this species, the *R. centifolia muscosa*, is the parent of the beautiful family of Moss Roses. When this variety was produced or discovered is not known, but that it is nothing more than a variety of *R. centifolia* is proved by the fact that plain and moss roses are often seen on the same bush. When Moss Roses are removed from our northern climate to Italy, the mossiness disappears. They are universal favourites, and between twenty and thirty garden varieties are enumerated. They are of almost all colours, from white to a dark rich crimson.

Rosa Gallica, the French Rose, is found wild about Montalbanum, Walzenberg, and Geneva, also in Austria, Piedmont, and the Caucasus. Upwards of one hundred varieties of this rose are found cultivated in gardens. The spotted, striped, and marbled roses belong to this species. The York and Lancaster Rose is a variety possessing white and red-coloured flowers.

Rosa Damascena, the Damask Rose, is supposed to have been originally brought from Damascus, and to be a native of Syria. It is much cultivated in gardens, and has not fewer varieties

than the last two. The Monthly Blush Rose, Blush Damask Rose, Red and White Monthly Rose, and Four Seasons Rose, are among the handsomest and best known varieties. The blossoms are exceedingly fragrant.

6. *Villosæ* contains the *R. alba*, White Rose; it is a native of Piedmont, Cochin China, Denmark, France, and Saxony. Its flowers are very large, exhaling a delicious fragrance. *R. Hibernica*, the Irish Rose, belongs to this division, and is interesting to the botanist as being entirely confined to Ireland.

7. *Rubiginosæ*, including the Eglantine, or Sweet Briar. It is common in Britain in bushy places on a dry gravelly soil.

8. *Caninæ* comprehends many of the varieties called Autumnal or Perpetual Roses, on account of their blooming late in the season and continuing in flower a long time. Most of the perpetual roses are highly fragrant, and more so in the later than the early months of the year. The soil in which they are grown cannot be too rich. In order to secure full blossoms in the autumn, all the flower-buds should be cut off in June, the shoots shortened, and the plants well watered and manured. They should never be planted on dry lawns, and wherever placed they should be manured every year. By retarding and forcing them, these roses may be made to blossom eight months in the year. Of the roses in this group that have afforded varieties for the garden, the *R. Indica*, Chinese Rose, stands first.

The Bourbon Rose (*R. Bourboniana*) is a natural hybrid between *R. Indica* and a variety called Red Four-Seasons. This hybrid was found amongst a number of the latter plants in a hedge in the Isle of Bourbon. It was brought to Paris, and has since produced many beautiful varieties. The flowers of this rose are very handsome, pendulous, with fine colours, and a most delicious fragrance. The Noisette Rose was grown from seeds produced from *R. moschata* impregnated with *R. Indica*. It was first reared in America.

Rosa Lawranceana, the Miniature or Lawrance Rose, belongs to this division. It was first brought from China, and is probably only a dwarf variety of *R. Indica* or *R. semperflorens*, which it closely resembles in structure. Some of these little 'fairy roses' produce blossoms when they are not more than six inches high. In cultivation they will not bear moisture, requiring in most soils a very dry, warm, raised border. They form elegant ornaments for the drawing-room. *R. Canina*, the Dog Rose, is one of the most common species of the division in this country.

9. *Systylæ*. *R. arvensis*, the Field or White Dog Rose, belongs to this group. It is a very common plant in many parts of England, adorning the hedges with its elegant snowy blossoms. The varieties of this and allied species, as *R. multiflora* and *R. sempervirens*, produce the Climbing Roses of the garden, of which there are a great number now to be had.

R. moschata, the Musk Rose, is one of the oldest inhabitants of our gardens. It is found native in the north of Africa, and in the temperate and warm provinces of Spain. It is an autumnal rose, and is very generally cultivated on account of the beautiful musk scent of its flowers. It is a tender plant, and our winters are generally too severe for it. Its bunches of flowers are frequently very large, requiring props for their support. The musky odour is most powerful at night. It is supposed to be the famous rose of Persia, in the branches of which the poets of that country delight to describe the *Bulbul* (nightingale) pouring forth her music.

10. *Banksianæ*. The most remarkable species in this group is the *Rosa Banksiæ*, Banksian Rose, named after Lady Banks. It is a native of China, and has very numerous double sweet-scented nodding flowers.

The rose is more frequently cultivated as an ornament than for its applications to medicine or the arts. It has however astringent and tonic properties which render it useful in medicine. In the East it is extensively grown for the purpose of procuring, in a variety of ways, the volatile oil which gives it its delicious fragrance. For these purposes the species that are mostly cultivated are *R. moschata*, *R. centifolia*, and *R. damascena*, from all of which the attar, otto, essence, or oil of roses may be procured in considerable quantities. The attar of roses forms an object of considerable commercial importance on the coast of Barbary, in Syria, Persia, India, and various parts of the East. Many other perfumes are made from roses, and are consumed in large quantities, as rose-water, vinegar of roses, spirit of roses, honey of roses, &c.

ROSA, SALVA'TOR, was born at Renella, a village near Naples, June 20, 1615. His parents procured him admission into the college of the congregation of Somasca in Naples; but before the expiration of the usual period of residence, he was either expelled or voluntarily quitted the college. On his return to Renella he devoted his time to music and poetry, and on the marriage of his eldest sister with Francesco Francanzani, he attended the studio of that artist. In 1633 he went on a tour through the wild scenery of La Basilicata, La Puglia, and Calabria, and occasionally associated with banditti. After this he returned to Renella, where his father died, leaving the family dependent upon Salvator, who now executed with great rapidity subjects on primed paper, his poverty not enabling him to purchase canvass, and sold them to dealers who kept stalls in the Strada della Carità in Naples. He attracted notice, and was enabled to visit Rome. Here he enjoyed the patronage of Cardinal Brancaccio, who took him to Viterbo, where he painted an altar-piece representing the incredulity of St. Thomas, for the Chiesa della Morte, and other works. In 1639 he went again to Rome, where his reputation reached its height. In 1647, on the breaking out of the revolt of Masaniello at Naples, Salvator became a member of the band. On the suppression of the revolt, he made his escape in the train of the Prince Carlo Giovanni de' Medici, with whom he went to Florence, where he was employed by the grand-duke to paint in the Pitti Palace. Here he associated with the literati and the principal nobility. After

remaining several years at Florence, he returned to Rome. In 1663 he executed three pictures for the exhibition of San Giovanni; one was Pythagoras on the sea-shore, the second was the same philosopher recounting his visit to the infernal regions, and the third the Prophet Jeremiah thrown into a pit; and soon after he produced his most celebrated picture, the Catiline Conspiracy. In 1668, at the annual exhibition of the Feast of San Giovanni Decollato, he placed his Saul and the Witch of Endor in competition with the works then shown of the elder masters. He died of dropsy, March 15, 1673.

Rosa possessed great invention, and had a wonderful facility of execution. He is superior when he confines his efforts to works of the easel size, and his figures are then correct in drawing and spirited in design. Of his landscapes, it may be observed, that he wholly rejected the simplicity and amenity cultivated by Claude and by Poussin, and indulged in gloomy effects and romantic forms; nor are his sea-pieces less forcible; in them he represents the desolate shores of Calabria, and not unfrequently adds interest to his works by the terror of shipwreck.

Salvator was also a musician and a poet of no common rank. He seems to have had a truer genius for music, as far as regards melody, than any of his contemporaries, and his verses are remarkable for strength and vigour of expression. To his other accomplishments he added architecture, and he excelled as a comic actor, an improvisatore, and a performer on various musical instruments.

ROSA DA TIVOLI. [Roos.]

ROSA'CEÆ, a natural order of Polypetalous Exogens. The genera of this order may be arranged under four groups or suborders, *Rosaceæ*, *Pomeæ*, *Amygdaleæ*, and *Sanguisorbeæ*.

Rosaceæ proper include the true Roses (*Roseæ*), the Cinquefoils (*Potentilleæ*), the Spiræas (*Spirææ*), and the Neuradas (*Neuradeæ*). They are herbaceous plants or shrubs. This family includes about 570 species and 20 genera, principally inhabitants of the temperate and cold zones of the northern hemisphere of the New and Old World; a very few are found on high land within the tropics, and a small number in the southern hemisphere. None of the plants of this section of the order are unwholesome. They are characterised by the presence of an astringent principle, which has led to the use of many of them in medicine.

Pomeæ, including the apple, pear, medlar, quince, service-tree, and mountain-ash, are inhabitants of Europe, Northern Asia, the mountains of India, and North America.

Amygdaleæ. The species are natives exclusively of the northern hemisphere, where they are found in cold or temperate climates. Many of them are poisonous, on account of the hydrocyanic acid they contain. They yield however some of our most valued fruits, as the peach, nectarine, plum, apricot, cherry, and almond, which last is the seed of *Amygdalus communis*.

. *Sanguisorbeæ* are found wild in heaths, hedges, and exposed places in Europe, North and South America beyond the tropics, and the Cape of Good Hope. Their principal property is astringency, and some of the species may be used as fodder.

ROSAMOND, FAIR. [Henry II.]

ROSARY. [Beads.]

ROSAS. [Cataluña.]

RO'SCIUS, QUINTUS, a celebrated Roman actor, was born near Lanuvium, but at what period is uncertain. He is frequently mentioned in the writings of Cicero, who was his friend and warm admirer. His talents also obtained for him the friendship of Sulla, who, during his dictatorship, presented him with a gold ring, the mark of equestrian rank. So perfect was Roscius in his art, that his name became almost synonymous with excellence in any other branch. Actors frequently received instruction from Roscius, who used to say however that he had never had any pupil with whom he was satisfied. (Cic. 'De Orat.,' i. 28.) Macrobius states that Roscius received about 1000 denarii a day for his acting (upwards of 35*l*.). He died about B.C. 61; since Cicero, in his oration for Archias, which was delivered in that year, speaks of his death as quite recent (c. 8). There is an extant oration of Cicero, though considerably mutilated, in defence of Roscius. The subject of the oration is a claim of 50,000 sesterces against Roscius by C. Fannius Chærea ('Ueber die Rede des Cicero für Q. Roscius,' in 'Zeitschrift für Geschichtl. Rechtsw.,' i., p. 248).

ROSCOE, WILLIAM, was born in 1753, near Liverpool, and received a common school education. When in his sixteenth year he was apprenticed to an attorney in Liverpool, and in 1774 he was admitted an attorney of the Court of King's Bench, and began to practise. In the meantime he wrote some poems, one of which made him known to Sir Joshua Reynolds, Fuseli, and other distinguished artists. In 1784 he was elected honorary member of the Manchester Literary and Philosophical Society. He also turned his attention to the subject of the slave-trade, and wrote several pamphlets recommending its suppression, and one or two political pamphlets. In 1796 Roscoe published the 'Life of Lorenzo de' Medici, called the Magnificent,' a work which established his literary reputation. After many years, Roscoe replied to various hostile critics, who accused him of undue partiality to Lorenzo, in pointed though temperate language, in his 'Illustrations, Historical and Critical, of the Life of Lorenzo de' Medici,' 4to., London, 1822. The second historical work of Roscoe is his 'Life and Pontificate of Leo X.,' to which similar objections were also made. Considered however as works of erudition and of general interest, the lives of Lorenzo and Leo by Roscoe stand deservedly high.

Roscoe was returned to parliament for Liverpool in the Whig interest. In the latter part of his life he became partner in a banking-house, in which however he was not successful. He died at Liverpool, in June, 1831. A biographical notice of him is appended to an edition of his 'Life of Lorenzo,' by his son.

ROSCOEA, a handsome genus of the highly-ornamental family of *Scitamineæ* or *Zingiberaceæ*, consisting of only a few species, which are confined to the Himalaya Mountains.

ROSCOMMON, an inland county in the province of Connaught in Ireland, is bounded N. and N.E. by the county of Leitrim, E. by Longford, S.E. by Westmeath and King's County, S.W. by the county of Galway, W. by Mayo, and N.W. by Sligo. The form of the county is irregular. The greatest length N. to S. is 60 miles; the greatest breadth E. to W. is 40 miles. The area is 949 square miles. The population in 1841 was 253,591.

Surface, Geology, and Rivers.—The surface of the county is partly undulating, but along the banks of the Shannon and the Suck, and in other parts, it is very flat. There are some mountains. The principal groups are the Braughlieve Mountains and Slievh Curkagh (1000 to 1200 feet high); the Curlew Mountains; the Slievh Bawn, 839 feet to 857 feet high; the hills between the Shannon and the Suck; and Slievh Aelwyn. The eastern side of the Slievh Bawn slopes gradually down to the bogs in the valley of the Shannon at their base; the western side is more broken.

The level parts of the county are for the most part occupied by the formations belonging to the great carboniferous limestone district of central Ireland. The impure argillaceous limestone, the black shale, and the sandstone, which form one of the subdivisions of the limestone group, and the lower limestone, which constitutes another subdivision, subjacent to the calp, are found in this county. The hills west of Castlerea are composed of the yellow sandstone, which is the lowest member of the limestone group. The Braughlieve Mountains and Slievh Curkagh are composed of shales and sandstones, with three beds of coal resting on beds of the millstone-grit series, from which good ironstone is obtained. The coal answers well for smelting iron, and is used in the Arigna iron-works in this county.

The Curlew Mountains and the Slievh Bawn consist of rocks of the old red-sandstone formation. Good limestone is quarried for building. Potters'-clay and pipe-clay are found in various parts of the county.

The county belongs to the basin of the Shannon, except a very small portion at the western extremity, which is drained by the Moy, which flows into Killala Bay. [Shannon.] Lough Allen, which the Shannon enters about five miles from its source, and through which it flows, is on the north-eastern boundary of the county. The Suck, the only important tributary of the Shannon, rises just within the county of Mayo, but its course is almost entirely within or upon the boundary of Roscommon; its length may be estimated at more than 60 miles.

Both the Shannon and the Suck are navigable. The Royal Canal opens into the Shannon opposite Tarmonbarry in this county; the Grand Canal just below the junction of the Suck. The traffic on the canals consists chiefly of corn and butter sent to Dublin, and English manufactures and general goods sent in return. The navigation of the Suck commences at Ballinasloe (county of Galway) for light flat-bottomed boats; small row-boats ascend higher. But a canal is cut parallel to it on the Galway side of the river, from Ballinasloe to the Shannon.

The principal lakes are Lough Allen (8 miles long N. to S., and 3 miles broad); Lough Bodarg and Lough Boffin (forming one sheet of water of intricate form, 5 miles from N. to S.E., and 7 miles to S.W.); Lough Forbes and Lough Ree (17 miles long from N. to S., and 7 miles broad), all on the Shannon; Lough Gara (5 miles long N. to S., and 5 miles broad); Lough Key; and several other smaller lakes.

Soil and Agriculture.—The soil in the limestone district is commonly fertile; there is however a large extent of bog or other wastes. The amount of pasture land is considerable: the natural pastures, which are esteemed to be some of the best ground in the county, are in the limestone districts. Rich deep loams are met with; and there are, especially along the limestone ridges between the Shannon and the Suck, extensive tracts of light shallow soil, so shallow indeed, that in some parts the plough cannot be used. These tracts are commonly used for sheep-feeding. The surface of the mountains is commonly wet and boggy, but there are intervening spots of dry ground covered with heath. Some of the soil in the sandstone districts, as in the Curlew Mountains, near Boyle, is very poor, but is capable of great improvement from the admixture of lime, or rather of a compost of lime and bog earth, which is to be had readily. Much may be done in this way, as well as by draining cold wet lands, whenever capital comes to be employed more extensively than at present in agricultural improvement.

The extent of the unimproved mountains and bogs has been estimated at above 130,000 acres, the bogs being dispersed over the face of the country in patches of various size and in almost every variety of situation: they are found on the tops of the highest mountains, on the banks of the loughs and rivers, and in the bottoms of the valleys. Several of those on the uplands are comparatively dry, and afford in their natural state coarse pasturage for young and hardy cattle. Many of the estates in the county are large, some belonging to resident landlords, others to absentees. Tillage has been considerably extended of late years; but, excepting on the land held by a few wealthy individuals, agriculture is in a very poor state, especially on the smaller farms.

Divisions and Towns.—Roscommon is divided into 9 baronies. It is in the united diocese of Kilmore, Elphin, and Ardagh. It is included in the Connaught Circuit, and the assizes are held at Roscommon. It has no parliamentary borough situated entirely within its limits. The county returns two members to parliament.

The following are the chief towns, with the population of each in 1841:—

Athleague is a village about 6 miles S.W. by S. from Roscommon. It is remarkable for nothing but a long series of bridges, connected by a cause-

way, carried obliquely across the river Suck, which here flows in a divided channel. Population of the village, 631. *Athlone* extends into this county on the south-east. [ATHLONE.] *Ballinasloe* is partly in this county, but the largest portion is in Galway. [GALWAY.] *Boyle* is a market town about 25 miles N. by W. from Roscommon, on the stream (the Boyle Water) which flows from Lough Gara into Lough Key. The town appears to have risen under the protection of a Bernardine abbey, the ruins of which exist on the left bank of the Boyle Water, about a quarter of a mile below the town bridge. The town is inconveniently laid out. The bridge over the river is a handsome structure, 100 feet long and 42 feet wide, of three arches. There are two other bridges below the town, which is the mart of the surrounding district. Population of the town, 3235. *Carrick-on-Shannon* is partly in Roscommon, but is chiefly in Leitrim. [LEITRIM.] *Castlerea* is a market-town, 13 miles N.W. from Roscommon, on the river Suck, which runs through the town, and divides it into two parts; a small stream, a feeder of the Suck, also runs through the town, and joins the river just below. The town consists principally of one long street, the continuity of which is interrupted by two bridges over the Suck and its feeder. Many of the houses are new; nearly one-half of the southern side of the street has been rebuilt. Some brewing and distilling is carried on, and there is a market for provisions. Population of the town, 1233. *Elphin* is a market-town 10 miles S.S.E. from Boyle. The town extends along the summit of a ridge, and runs nearly east and west: many of the houses are of a very wretched description. The cathedral, a barn-like building, with a square tower, stands at the eastern end of the town, and the Catholic chapel at the western. The bishop's palace is a spacious and comfortable country-house, with a lawn in front. Population of the town, 1551. *Jamestown* is partly in this county and partly in Leitrim. [LEITRIM.] *Lanesborough* is partly in this county and partly in Longford. [LONGFORD.] *Roscommon*, the chief town, is about 25 miles S. by E. from Boyle. It appears to have derived its origin from an abbey founded about A.D. 550, by St. Coman or Comanus. Another abbey of greater magnificence was founded here for the order of Preaching Friars, about A.D. 1257, by O'Conor, king or prince of Connaught; and a few years after, a strong castle was built by Sir Robert de Ufford, one of the early English adventurers. Of these last two edifices there are considerable remains: the castle is on the north side of the town, and the abbey on the south side. Both are on level ground, while the town occupies the eastern and southern slopes of an intervening eminence. The town consists of three or four streets irregularly laid out, having in the centre an open space opposite the old gaol. A new courthouse and a new gaol have been built, and near them are some good new houses; but with the exception of these, the town presents an appearance of wretchedness and decay. There is a neat church with a square tower. The shops are numerous, but business does not appear to thrive as in some other towns in the county. Coarse pottery is manufactured near the town. Population of the town, 3439. *Strokestown* is a market-town about 15 miles S.S.E. from Boyle. It consists of two streets crossing at right angles. A large number of the houses are mere cabins. Population of the town, 1611.

History and Antiquities.—In the earliest historical period this county appears to have been partly or wholly in possession of the Auteri, a people mentioned by Ptolemæus, and supposed by Sir James Ware ('Hist. of Ireland,' vol. ii., ch. 6.) to have inhabited some part of the counties of Galway and Roscommon.

Of the earliest period there are few memorials; the raths (hill-forts or earth-works) are the principal. Of these there are more than four hundred and seventy. They are always upon natural eminences. At Oran, between Roscommon and Castlerea, is one of the round towers whose use and origin are so uncertain.

After the English invasion of Ireland, Roscommon formed part of the kingdom of Connaught, and was governed by Roderic O'Conor, recognised as sovereign of Ireland. This part of the country appears to have been long in a state of anarchy, the Irish septs struggling for independence with the De Burgos, their Anglo-Norman masters. Of this troubled period there are several memorials in the ruined castles and monastic buildings which exist, the chief of which are Roscommon Castle, and Roscommon, Boyle, and Clonshanvill abbeys. Between Roscommon and Castlerea are the ruins of Ballintobber Castle, the ancient stronghold of the O'Conor Dhunne or Don. A very remarkable ruined fort of unknown antiquity is to be seen near Lough Glynn. The keep of Athlone Castle, which is yet standing, is a decagon, and is in the Roscommon part of the town. There are several remains of other castles.

In the reign of Elizabeth, Connaught was formed into counties, and the county of Roscommon divided into baronies.

ROSCOMMON, WENTWORTH DILLON, EARL OF, was born in Ireland about 1633. He was the son of James Dillon, third earl of Roscommon, and Elizabeth Wentworth, sister to the Earl of Strafford. Upon the breaking out of disturbances in Ireland, Strafford sent for him, and placed him at his own seat in Yorkshire, where he had him instructed in Latin. When the storm had overtaken Strafford, Dillon was sent to Caen, where he prosecuted his studies under Bochart. He travelled into Italy, and returning to England at the Restoration, was made captain of the band of pensioners, and subsequently master of the horse to the Duchess of York. He died in 1684.

Roscommon wrote the following works: 'An Essay on translated Verse,' London, 1680, 4to.; 'Prologues and Epilogues to Plays,' &c., collected 1684, 8vo.; Horace's 'Art of Poetry,' translated into English blank verse, 1680, 4to.; 'Dr. William Sherlock's case of Resistance of Supreme Powers,' 8vo.

ROSE. [ROSA.]

ROSELLI, COSIMO, a painter, was born at

Florence, according to Gaye, in 1439. There are few of his works remaining; the principal is the fresco in the convent of Sant' Ambrogio, at Florence, painted in 1456, according to an inscription seen upon it by Rumohr, representing the transportation of a miracle-working chalice from the church of Sant' Ambrogio to the episcopal palace.

Roselli was one of the painters invited by Pope Sixtus IV. to Rome to paint the Capella Sistina, built in 1473, by Baccio Pintelli, for that pope. Cosimo's paintings in this chapel are still in good preservation; they are—the Destruction of Pharaoh's Host in the Red Sea; Moses receiving the Tables of the Law while the Israelites are worshipping the Golden Calf; the Sermon on the Mount; the healing of the Leper; and the Last Supper. The landscape of the third picture was painted by Cosimo's pupil, the eccentric Piero di Cosimo, afterwards the master of Andrea del Sarto.

Cosimo Roselli was still living in 1506: Vasari says he was 68 years old when he died.

ROSELLI'NI, IPPO'LITO, Cavaliere, was born August 13, 1800, at Pisa. His father was a merchant, and Rosellini himself was designed for his father's business; but he commenced at an early age to give himself up to those studies for which he afterwards distinguished himself, and the mercantile career was abandoned. In 1821 he finished his university studies in Pisa. He afterwards studied the Oriental languages for three years with Mezzofante at Bologna; and in 1824 he was appointed professor of Oriental languages in the university of Pisa. About 1825 he commenced the study of Egyptian antiquities, in which he followed the steps of Champollion, of whom he was an ardent admirer. In the autumn of 1827 the Grand Duke of Tuscany granted Rosellini leave of absence, with funds for himself and six companions, to accomplish his design of exploring the monuments of Egypt. The French government determined to send Champollion with five companions upon a similar expedition, and they all embarked together at Toulon, July 31, 1828, and landed on the 18th of August following in Egypt, where they remained fifteen months, exploring the principal monuments of Egypt and Nubia.

The great results of the expedition were to appear in a joint work by Champollion and Rosellini. But by the death of Champollion in March, 1832, the whole work devolved on Rosellini; and in November, 1832, appeared the first volume of 'I Monumenti dell' Egitto e della Nubia,' by Rosellini, explaining the historical monuments. This was followed by other volumes; but the work remained unfinished at the time of Rosellini's death in June, 1843. The third part of the work was published in 1844, under the direction of professors Bonaini and Severi. This great work on Egypt, invaluable as a picture of ancient Egyptian life and Egyptian art, is in three parts, each of which is in one large folio volume, with illustrative letter-press, in octavo. The first volume, Tavole, M. R., contains the historical monuments, *Monumenti Storici*, in 169 plates, with four volumes of text, 1832–41; the second, Tavole, M. C., contains the civil monuments, *Monumenti Civili*, in 135 plates, with three volumes of text, 1834-36; and the third, Tavole, M. D. C., the monuments of religious worship, *Monumenti del Culto*, in 86 plates, with one volume of text, 1844.

ROSEMARY. [Rosmarinus.]

ROSEN, FRIEDRICH AUGUST, was born on the 2nd of September, 1805, at Hanover. He received his earliest education from his father, and afterwards went to the gymnasium at Göttingen. In the year 1822 Rosen went to the University of Leipzig, and two years afterwards to Berlin. He was early distinguished for his classical attainments and his knowledge of the Semitic languages. He afterwards studied Sanscrit under Professor Bopp, who was professor of Sanscrit at the University of Berlin. In 1826, when he took his degree of Doctor of Philosophy, he published his 'Corporis Radicum Sanscritarum Prolusio,' which was only the forerunner of his larger work, 'Radices Sanscritæ,' Berlin, 1827. Rosen also applied himself with the greatest success to the study of Arabic and Persian; and he had prepared for publication several large episodes of the 'Sháh Náhmah,' the great epic poem of the Persians. In 1828 he accepted the appointment of Professor of Oriental Languages in the University of London (now University College), then just established. Though he had a few pupils in Sanscrit, Arabic, and Persian, it soon became evident that a teacher of the Hindustani language was more wanted at the London University than a professor of Oriental languages. Accordingly Rosen applied himself for several months with great industry to the Hindustani, in order that he might qualify himself to teach the language. Some years afterwards he resigned his professorship of Oriental languages; but he subsequently accepted the Sanscrit professorship in University College. Rosen acted as honorary foreign secretary of the Royal Asiatic Society and as secretary to the Oriental Translation Committee. This brought him into communication with that great Oriental scholar Colebrooke, by whose advice he published, under the sanction of the Translation Committee, the Arabic text of the 'Algebra of Mohammed ben Musa,' with an English translation, accompanied with excellent notes.

Amidst these various occupations he had not lost sight of a higher and more arduous task, in which he wished to concentrate all his attainments. Having discovered that the character of the Indian literature and language could only be completely understood by tracing them back to the earliest periods to which the 'Vedas' belong, he desired to remove the obscurity by which they are surrounded. In 1830 he published his 'Rig Vedae Specimen,' Taylor, London, and from that time his principal attention was directed to this great object. In order to understand the obsolete language of these ancient writings, he had to study the oldest of the grammatical works of the Hindoos; and he then applied himself to the Commentaries, without a full knowledge of which the texts are unintelligible. All this was done under very disadvantageous circumstances, and it is a

matter of great regret that he was not placed in a situation which would have made other labour unnecessary.

Among his other literary labours was the revision of the 'Dictionary, Bengali, Sanscrit, and English,' published by Sir Graves Houghton, London, 1833-4. He also made the 'Catalogus Codicum Manuscriptorum Syriacorum et Carshunicorum in Museo Britannico,' which was published after his death, under the care of the Rev. Mr. Forshall, who, in his address to the reader, has justly attributed to Dr. Rosen all the merit of this catalogue. But Dr. Rosen's name does not appear either on the title-page of this catalogue, nor after the Præfatio which he wrote, and which is printed at the head of the catalogue. At Colebrooke's request he undertook the collection of his 'Miscellaneous Essays,' to which he added an excellent index, 2 vols., London, 1827. He also wrote all the articles relating to Oriental literature in the 'Penny Cyclopædia,' from the article 'Abbasides' to the article 'Ethiopian Language,' both included, together with several articles on Eastern Geography, such as 'Arabia' and 'Armenia.' For the 'Journal of Education' he wrote a review of Bopp's 'Vergleichende Grammatik,' &c. (vol. viii.), and two reviews of Pott's 'Etymologische Forschungen' (vols. ix. x.).

In the year 1836 he began to print the collection of the hymns of the 'Rig Veda,' giving the Sanscrit text, a Latin translation, and explanatory notes. In the autumn of 1837 he had advanced so far that he intended to publish a first volume, when his sudden death interrupted an undertaking for which no man in Europe was so well qualified or prepared as himself. The Translation Committee published the book after his death, as far as it was completed, under the title 'Rig Veda Sanhita Liber Primus, Sanscrite et Latine,' London, 1838, 4to.

The acquirements of this distinguished scholar were even surpassed by his virtues. The simplicity of his pure and elevated mind, the gentleness of his manners, and, above all, the genuine kindness of heart which formed the striking feature of his character, secured for him, in an eminent degree, the affection of all who knew him. His readiness on all occasions to aid and advise his literary friends, at any cost of labour, is well known to many who will read this notice.

ROSENMÜLLER, JOHANN GEORG, was appointed professor of divinity in the University of Leipzig, and superintendent in the Lutheran church at the same place in 1785, and died in 1815. His chief works are :—'Historia Interpretationis Librorum Sanctorum in Ecclesia Christiana, ab Apostolorum Ætate ad Literarum Instaurationem,' 5 parts, 8vo., 1795–1814; and 'Scholia in Novum Testamentum,' 5 vols. 8vo.

ROSENMÜLLER, ERNST FRIEDRICH KARL, son of the preceding, was born Dec. 10, 1768, and died on the 17th of September, 1835, after having for many years held the office of professor of oriental languages in the University of Leipzig. His chief work is 'Scholia in Vetus Testamentum,' 23 vols. 8vo., which is a philological and exegetical commentary on the Pentateuch, Isaiah, the Psalms, Job, Ezekiel, the minor prophets, Jeremiah, the writings of Solomon, Daniel, Joshua, Judges, and Ruth. The first edition was published 1795–1826, the second 1823–34. In the second edition several rationalistic interpretations which appeared in the first are greatly modified. Rosenmüller's profound oriental learning and industry have made this work one of the very best commentaries upon the Old Testament. His 'Handbuch der Biblischen Alterthumskunde,' 4 vols. 8vo., 1823–31, was left incomplete at the author's death. The volumes published are, three on the geography and one on the natural history of the Bible.

ROSETTA, or EL RASCHID, a town of Lower Egypt, is situated in 31° 25′ N. lat., and 30° 28′ E. long., on the left bank of one of the principal branches of the Nile, and about four miles from its mouth. It is said to have been built by the son of Haroun-al-Raschid, about A.D. 875; but it did not become a place of any note till after the decline of Damietta. Rosetta is not so large as Damietta: its population amounts to about 9000. The country around it is a complete garden. The town contains several large mosques. The principal streets, which are not more than two yards wide, run parallel to the river. Along the left bank of the Nile there is a wide promenade. The houses, which are built of a dingy red brick, are two or three stories high. The bazaars are narrow, dirty and dark. Rosetta carries on a considerable trade both with Europe and the Levant; but the passage of the bar at the mouth of the Nile is always attended with some danger, as the sands are constantly shifting, and the surf is high.

ROSETTA STONE is the name given to a stone in the British Museum, which was found by the French among the ruins of Fort St. Julien, near the Rosetta mouth of the Nile. It was delivered up to the British on the capitulation of Alexandria, and was brought to England in 1802. This stone, which is a piece of black basalt, contains parts of three inscriptions: the highest on the stone is in what we call hieroglyphics; the second is in that character commonly called the 'enchorial,' or 'the characters of the country;' and the third, which is in Greek, declares, at the end, that the decree which this stone contains was cut in three different characters, the 'sacred characters,' 'those of the country' or the 'enchorial,' and the 'Greek.' In its present state the stone is much mutilated, chiefly at the top and at the right side. The Greek text states that the inscription was made in the reign of Ptolemæus V., Epiphanes, who became King of Egypt B.C. 205. (See 'Egyptian Antiquities' in the 'Library of Entertaining Knowledge.')

ROSHEIM. [RHIN, BAS.]

ROSICRUCIANS is the name of a secret society whose existence became first known to the public in the 17th century, by means of several publications which have been attributed to Johann Valentine Andreä, a German scholar, born at Herrenberg, in the duchy of Würtemberg, in 1586. In one of these works, entitled 'Fama

Fraternitatis des löblichen Ordens des Rosenkreuzes,' Frankfort, 1617, there is a story of a certain Christian Rosenkreuz, a German noble of the 14th century, who, after travelling long in the East, returned to Germany, and there established a fraternity, or secret society, of a few adepts, under certain regulations, living together in a building which he raised under the name of Sancti Spiritus, where he died, at 106 years of age. The place of his burial was kept a profound secret by the adepts, and the Society renewed itself by the admission of successive new members in silence and obscurity, according to the last injunction of its founder, who directed the following inscription to be placed on a door of Sancti Spiritus:—'Post CXX. annos patebo.' Andreä, in another work, 'Confessio Fraternitatis Roseæ Crucis ad Eruditos Europæ,' states that the order does not interfere with the religion or polity of states, but only seeks for the true philosophy. Some have ascribed to the Rosicrucians the same hostile plans against all established churches and monarchies which have been also attributed to the Illuminati, Freemasons, Carbonari, and other secret societies. Others say that the order of Rosicrucians is identical with that of Freemasons, one of whose degrees or dignities is called in some countries the degree of the Red Cross. The Rosicrucians have not been heard of as a separate order for nearly a century past. The reader who wishes to investigate this obscure subject may consult F. Nicolai, 'On the Crimes ascribed to the Templars;' Chr. Murr, 'On the True Origin of the Rosicrucians,' 1803; and J. G. Buhle, 'Ueber den Ursprung und die vornehmsten Schicksale der Orden der Rosenkreuzer und Freymaurer,' Göttingen, 1804. Buhle seems to think that the Rosicrucians are but a branch or affiliation of the Freemasons.

ROSIN. [RESINS.]

ROSMARI'NUS, a genus of plants belonging to the natural order *Lamiaceæ*. *Rosmarinus officinalis*, the Common Rosemary, is a very desirable plant for the garden, both on account of its evergreen character and its flowers, which appear from January to April. There are three varieties known in gardens, the Green or Common, the Gold-Striped, and the Silver-Striped, which are distinguished principally by the colour of their leaves. The green variety is the hardiest, and is most generally used. It may be propagated by seeds, or slips or cuttings of the young shoots. The striped varieties may be best propagated by layers of the young wood. They should be planted in a warm situation, as they are much more tender than the green. They are only cultivated as ornamental plants on account of their variegated leaves.

Rosmarinus officinalis, Rosemary, called also *Anthos*, a term which is apt to lead to the confounding of Rosemary with the *Ledum palustre*, or wild Marsh Rosemary, which has very different and even dangerous properties. Genuine Rosemary is a shrub, a native of the south of Europe, Asia Minor, and China. The officinal part is the tops or upper part of the twigs.

Oil of Rosemary (*Oleum Rorismarini*, or *Ol. Anthos*) is chiefly prepared in Spain and the south of France, by distillation of the leaves and flowers. At first it is nearly transparent and very limpid, but by time it becomes both yellowish and thicker. It possesses the strong penetrating odour of rosemary, with a camphor-like intermixture, and a burning taste. It has an acid re-action.

Rosemary possesses valuable stimulant and carminative properties; but it is chiefly employed as a perfume, entering into the composition of the Queen of Hungary's Water, Eau de Cologne, and aromatic vinegar. It is also said to promote the growth of hair and prevent baldness.

ROSMI'NI, CARLO DE', born in 1758 at Roveredo, in the Italian Tyrol, studied first at Innsbrück, and then in his native town, where he early showed his aptitude for literary composition. He afterwards removed to Ferrara, where he published in 1789 a Life of Ovid:—'Vita di Ovidio Nasone.' This work obtained for Rosmini the honour of being inscribed among the members of the Florentine Academy. He next wrote: 'Della Vita di L. Anneo Seneca libri quattro,' Roveredo, 1793. In 1801 he wrote an account of Vittorino da Feltre, a preceptor of the 15th century, and of his system of education: 'Idea dell' ottimo Precettore nella Vita e Disciplina di Vittorino da Feltre e de' suoi Discepoli.' This book may be called a treatise on pedagogy, as well as the next work published by Rosmini on Guarino Veronese, and upon his school: 'Vita e Disciplina di Guarino Veronese e de' suoi Discepoli,' 3 vols. 8vo., Brescia, 1805–6. Rosmini wrote a Life of the learned Filelfo, 3 vols. 8vo., and also a Life of Trivulzio, a great captain of the 16th century, 2 vols. 4to., 1815. The last work of Rosmini was his history of Milan: 'Dell' Istoria di Milano Libri XVIII.' Rosmini ranks among the principal Italian biographers of our times. He died at Milan in 1827.

ROSS and CROMARTY SHIRES, two Scotch counties, intimately connected both locally and otherwise. They lie between 57° 8′ and 58° 10′ N. lat., and between 4° and 5° 46′ W. long. The county of Ross comprehends a considerable area on the mainland of Scotland, together with the large island of Lewis, one of the Hebrides; and Cromarty is composed of a number of detached portions, either interspersed among the inland parts of Ross or lying along its border. The northern side of the mainland of the two counties is for the most part conterminous with Sutherlandshire, extending about 60 miles from Tarbet Ness, on the eastern side of Scotland, to Loch Enard on the western side. Invernesshire and the Moray or Murray Frith form the boundary on the S. and S.E. The Frith of Cromarty penetrates 10 miles inland from the Moray Frith, forming a long narrow inlet, little more than two miles wide in the broadest part. The western boundary, formed by the coast of the Atlantic, is characterised by bold headlands separated from each other by deep but generally narrow inlets or lochs. There are several small islands off this coast. The island of Lewis is N.W. of the mainland coast of the county, the nearest distance across the Minch, or intervening channel, being

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about 25 miles. Lewis is not, strictly speaking, an island of itself; it forms the northern and by far the larger portion of the principal island of the Hebrides, sometimes called the Long Island; the southern portion, called Harris, belongs to Inverness-shire. Lewis is 39 miles long N. to S., and 31 miles broad E. to W. The area of the two counties is 2424 square miles, Ross-shire being 2079 square miles, and Comarty 345 square miles; but this does not include the islands, of which the area may be estimated at 550 square miles, thus making the total area amount to 2974 square miles. The population in 1841 was 78,685.

Surface and Rivers.—With the exception of the two peninsulas formed by the three friths Dornoch, Cromarty, and Moray, and the parts immediately adjacent to them, Ross and Cromarty consist of mountains irregularly grouped, with deep intervening glens or ravines. Ben Derag, one of the Ben More Hills, near the head of Loch Broom, is 3551 feet above the level of the sea, and Ben Attow, on the border of Ross-shire and Inverness-shire, is said to be nearly 4000 feet high.

The two counties have no large rivers. The Oikel rises at the foot of Ben Mohr in Sutherlandshire, and flows for 26 miles along the border of Sutherlandshire and Ross-shire till it unites with a stream from Loch Shin in Sutherlandshire. It then expands into a narrow lake 5 miles long, called the Kyle, which opens into Dornoch Frith. The Repath Water and Carron Water are one stream 24 miles long, which joins the Kyle at its lower end. A number of streams flowing eastward unite above Dingwall, just below which they fall into Cromarty Frith. There are numerous lochs, or inland lakes, of which Loch Maree, the largest, is 12 miles long and about 2 miles wide. The inlets from the sea, also called lochs, are very numerous.

Soil and Agriculture.—The arable land of the two counties is almost entirely confined to the eastern part, comprehending the two peninsulas, the Black Isle, between Loch Beauley and Cromarty Frith, and Easter Ross, between the Cromarty Frith and Dornoch Frith, together with the comparatively low and level tract immediately adjacent to these. The central and western parts are wild, rugged, and mountainous, interspersed with lakes and narrow glens that afford pasture for sheep and black cattle. Since the commencement of the present century, agriculture has been much improved. The soil in the peninsula of the Black Isle is various, and much of it poor. The cultivated portion consists chiefly of clayey loam, good black mould, and sandy loam. In Easter Ross there is a considerable extent of clayey loam and light sandy soil. The crops are clean, and for the most part rich. The houses of the principal farmers are neat and commodious, and the cottages of the peasantry have much improved of late years. Much of the improvement in agriculture is to be ascribed to the improved communications formed and maintained by the government commission for Highland roads and bridges.

A marked improvement in domestic animals of every description has of late years taken place in the northern counties. The Cheviot sheep have been introduced; pains have been taken to improve the breed of cattle by the importation of the most improved sorts from the West Highlands and of cows from Ayrshire; attention has been paid to the breed of horses, both for the purposes of agriculture and draught; and several new sorts of pigs, both pure and crosses, have been introduced. The original native breed of cattle is hardy and compact, adapted to the climate. The western side of the county, where it has not been thrown into large sheep-farms, is occupied by a poor class of tenants. They have some arable land, in which potatoes, barley, and oats are raised; but the number of acres under cultivation is not great, nor has planting been carried to any extent. The greater part of the country is an open waste. Deer are tolerably numerous in some places. The fox, badger, polecat, weasel, and marten are common; as are the eagle, raven, and a variety of hawks and owls. Grouse are perhaps diminishing.

There are stone quarries in some parts of the two counties, but they are comparatively unimportant. There is limestone, but no coal.

Divisions and Towns.—The two counties are divided into 33 parishes, which are comprehended in the five presbyteries of Tain, Dingwall, Chanonry (*i.e.* Fortrose), Lochcarron, and Lewis. The presbyteries of Tain, Dingwall, and Chanonry, are in the synod of Ross; those of Lochcarron and Lewis in the synod of Glenelg. The two counties unite in returning one member to parliament; and Cromarty, Dingwall, Dornoch, Kirkwall, Tain, and Wick, unite in returning another, forming the Wick Parliamentary District.

The following are the principal towns, with the population of each in 1841:—

Cromarty, a royal burgh, contributory to the Wick District, is situated on the south side of Cromarty Frith, 8 miles N.N.E. from Fortrose. The town stands on a low alluvial tongue of land jutting out into the frith. It is irregularly built, and the more ancient streets and lanes are of a homely style of architecture. It contains a plain church, a Gaelic chapel, and a town-house. The harbour, formed by a pier, is near the extremity of the point on which the town stands. A considerable trade is carried on with England in salt provisions, and the herring fishery is pursued to some extent. Population of the town, 1936.

Dingwall, a royal burgh, contributory to the Wick District, is situated at the south-west extremity of Cromarty Frith, about 17 miles S.W. from Cromarty. The town consists of one main street and one or two smaller ones branching from it. The streets are paved, and there are some good houses and shops. The kirk is a neat and commodious building, just out of the town. The town-house, a curious old building with spire and clock, is near the centre of the town; and there is a small gaol and an episcopal chapel. A short canal from the Frith enables vessels with coals and other merchandise to come quite up to the town. Population of the town, 1732.

Fortrose, a royal burgh, is situated on the shore of Moray Frith, just within the narrow

passage by which that frith is contracted opposite Fort George, 9 miles S.W. from Cromarty. The town is small, with little manufacture and very little trade; and Rosemarkie, with which the burgh is joined, is an insignificant fishing-village. There are some remains of the ancient cathedral at Fortrose. The town contains an episcopal chapel and a prison. The parish church is at Rosemarkie. Population of the town, 955.

Stornoway, a burgh of barony, and the only town in the Isle of Lewis, is situated at the head of a bay on the east side of the island. The houses are in general good, with slate roofs, and many not only well but even elegantly furnished. There is a handsome kirk, a neat custom-house, a town-house, and an assembly-room. The harbour is good and much frequented. Population of the town, 1354.

Tain, a royal burgh, contributory to the Wick District, is situated on the shore of Dornoch Frith, about 23 miles N.E.N. from Dingwall. The town stands on a ridge or terrace, overlooking a low plain which extends from the foot of the terrace to the present shore, a quarter of a mile distant. One or two brooks rise near the town and flow through the plain into the sea; and on the east side of the town another stream, the Tain, larger than these, flows also into the sea. Tain is irregularly built, but has been much improved of late years. The town contains a large substantial church, a handsome manse or parsonage-house, an academy, a handsome town and county-house, and a prison. The principal trade consists in the supply of the surrounding districts. Population of the town, 1872.

History and Antiquities.—At the earliest historical period this country appears to have been inhabited, the western part by the Creones, the eastern part by the Cantæ (Κάνται), and the centre by the Caledonii (Καληδόνιοι) of Ptolemæus; but it is impossible to assign the limits of their respective territories.

Of this early period Ross-shire contains several remains. In Kincardine and Fearn parishes are some Druidical circles, and also on the eastern shore of Loch Roig, in Lewis. Stone coffins, vitrified ruins, stone obelisks, on or near the eastern coast, and the traces of habitations in the caves of the western coast, belong to early but unascertained periods.

At a subsequent period Ross became an earldom, which was united with the Lordship of the Isles (*i.e.* the Western Isles) by the marriage of Donald M'Donald, the Lord of the Isles, with the daughter of the Earl of Ross. In 1476 the Earl of Ross, for rebellion against King Robert III., was deprived of his possessions, which were all annexed to the crown. He was in return created a peer of parliament with the title of John de Isla, Lord of the Isles. During this period Ross gave title to a bishopric, erected by David I., king of Scotland; the cathedral was at Fortrose.

There are several remains of ancient castles in Ross-shire. Lochlin Castle is on an eminence six miles east of Tain; Craighouse Castle is on the southern shore of Cromarty Frith; the castles of Killcoy and Redcastle are on the shore of Moray Frith, or rather of Loch Beauley. There are also some ecclesiastical ruins. Lochlin Abbey, or Fearn Abbey, is near the castle of that name, east of Tain; and there are ruins of a number of ancient chapels in Lewis.

ROSS. [HEREFORDSHIRE.]

ROSSI, ROSSO DE', or IL ROSSO, called in France *Maître Roux*, was born in Florence in 1496. He studied the works of Michael Angelo, and was distinguished for the boldness and freedom of his style. His paintings are not numerous in Italy, as he passed the best portion of his career from about 1530 in the service of Francis I. at Fontainebleau, where he superintended all the works of the palace. In 1541, while still at Fontainebleau, a few hundred ducats were stolen from him, and he accused his friend and assistant Francesco Pellegrini of the theft, who was put to the torture, and was declared to be innocent. Rosso's sorrow for what had happened, and the taunts of Pellegrini and his friends together, annoyed him to that extent that he poisoned himself. Many of his works at Fontainebleau were destroyed by his successor Primaticcio. Several of his productions have been engraved.

ROSSI, JOHN CHARLES FELIX, R.A., was born at Nottingham in 1762; his father, a native of Siena, practised as a medical man at Nottingham. Young Rossi was apprenticed very early to a sculptor named Luccatella, with whom he also worked as a journeyman. He afterwards went to London, where, still a boy, he entered as a student of the Royal Academy; and in 1781 he obtained the silver medal, and in 1784 the gold one, which entitled him to three years maintenance at Rome. He went to Rome in 1785; in 1788 he returned to London; in 1800 he was elected an associate of the academy; and only two years afterwards an academician. He was subsequently appointed sculptor to the Prince Regent, and he was employed in decorating Buckingham Palace. He was afterwards sculptor to William IV. But he had little to do after the completion of his great public monuments in St. Paul's Cathedral. He died Feb. 21, 1839.

Rossi was both a classical and a monumental sculptor, and his style was manly and vigorous, especially in his monumental works. Of the first class the following may be mentioned:—A Mercury in Marble, executed in Rome; a recumbent figure of Eve, in marble; Edwin and Eleanora; Celadon and Amelia; Musidora; Zephyrus and Aurora; and Venus and Cupid. A statue of Thompson the poet by him is in the possession of Sir Robert Peel; and there is a large colossal statue of Britannia on the Exchange at Liverpool. The works however by which he is best known are the monuments which he executed in St. Paul's Cathedral.

ROSTELLUM, a botanical term applied occasionally to very different parts: 1, it is most frequently used as a diminutive of rostrum, to express any small beak-shaped process; 2, it is applied to the short beak-shaped process found on the stigma of many violets, as *Viola hirta*, *V. odorata*, and *V. canina*, &c.; and *Orchidaceæ*,

as *Orchis, Spiranthes, Listera,* &c.; 3, some writers have also used this term to indicate the radicle or descending element of the embryo of the seed.

ROSTOCK. [MECKLENBURG.]

ROSTRUM, a botanical term applied to any rigid prolongation of remarkable length, or to any additional process at the end of any of the parts of a plant. Under this term are included most processes and long points of an irregular character, as the thin apices upon the operculum of the sporangium of many mosses; the lengthened tube of the calyx upon the achenia of *Scabiosa, Tragopogon, Lactuca,* and many other *Compositæ,* also of *Scandix* and *Anthriscus;* the remaining and often enlarged style upon many fruits, as of *Brassica, Sinapis, Saxifraga,* and many other prolonged points, as those upon the ultriculate induvia of *Careæ flava* and *C. ampullacea.* The term *Cornu* is often applied to parts similar to rostrum.

ROSTRUM, or, more properly, ROSTRA, was a platform or elevated space of ground in the Roman forum, from which the orators used to address the people, and which derived its name from the circumstance that after the conquest of Latium the beaks (rostra) of the Antiatian ships were affixed to the front of it. ('Liv.,' viii. 14.) The rostra was between the Comitium, or place of assembly for the Curiæ, and the Forum, properly so called, or place of assembly for the Comitia Tributa.

ROT, DRY. [DRY ROT.]

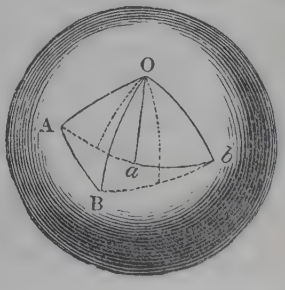
ROTATE, a botanical term applied to either the calyx or corolla, when the tube is very small or entirely wanting, and the petals or sepals are united and spreading. Examples are seen in the genera *Anagallis, Lysimachia, Borago, Solanum, Verbascum, Galium,* and *Rubia.*

ROTATION (*Rota,* a wheel). The popular conception of a body in rotation is vague, except only in the case in which the rotation is made about an immoveable axis. This subject has accordingly been usually treated by mathematical methods; and mathematicians, content with their results and with their power of interpreting them, did nothing towards the improvement of the manner of presenting the elementary view of rotation. Within the last twenty years however, a French philosopher of a truly remarkable genius for simplifying the elements of mechanics, M. Poinsot, has presented the subject in a point of view which would excite wonder that ideas so simple should never have occurred to any one before, if it had not been so often seen that simplicity is not a fruit of the first growth.

There is this parallel between the conception we form of the simple motion of a point and that of a solid body, namely, that each has a case of peculiar simplicity, by which others are rendered more easy to describe. A point may move in a straight line, or may preserve its direction unaltered; a body may revolve round a fixed axis, or each point may preserve its circle of revolution unaltered. But, owing to the comparative simplicity of the motion of a point, it is easy to carry with us, when it moves in a curve, the idea of its still having a different direction at every point of the motion, namely, that of the tangent of the curve. It is not so easy to see that whenever a body moves about a fixed point, no matter how irregularly, there is always, at every instant of the motion, some one axis which is, for that instant, at rest. This notion of an instantaneous axis of repose, not continuing to be such for any finite time—answering to that of an instantaneous direction in curvilinear motion, which does not continue for any finite time to represent the direction—must be first distinctly formed, before any satisfactory account of the rotation of a body can be given.

Let us suppose a uniform sphere, with a fixed centre, but otherwise free to move in any way. Let a succession of forces act upon it, gradual or not, in such a manner that it will never move round one axis for any finite time during the continuance of their action. At a certain moment, let all the forces cease entirely, leaving the sphere to itself. It is easy enough to see that from and after the moment of discontinuance, the sphere will move round an axis which remains unaltered; or, if this be not perfectly perceptible, the geometrical considerations presently to be given will make it so. There must then, at the very moment of discontinuance of the forces, have been an axis which was for that moment at rest, namely, the axis on which the motion is to continue after the forces cease. In this way, knowing that curvilinear motion would become rectilinear the moment that the constraining forces are removed, we might form an idea, if we had not one otherwise, of the tangent of a curve, the line of direction for the time being, and which would continue to be the line of direction if the forces were removed.

Now let the sphere, the centre being fixed, have moved from any one position (P) into any other (Q), but not round one axis. If a point were to move from A to B, however curvilinear the intermediate path might be, it *might* have moved from A to B in a straight line, the chord of the curve. Similarly, it may be shown that however *unaxical* the manner in which the sphere moves from position (P) to position (Q), it might have been changed from the one to the other by a motion of simple revolution. To show this, remember that, the centre being fixed, the positions of any two points of the sphere, not opposite, give the position of the sphere, so that, if any two such points chosen in the position (P) can be transferred to their places in (Q) by a simple revolution of the sphere round an axis, the whole sphere is transferred by that same revolution.

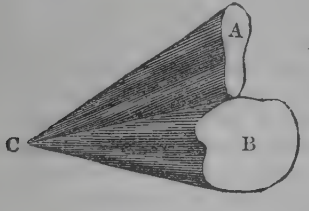


Suppose that A B, an arc in the position (P), comes to $a\,b$ in the position (Q). Bisect A a and B b, and let great circles, drawn through the points of bisection perpendicular to A a and B b, meet in O. Then it is easily proved that O A = O a, O B = O b, whence A O B, a O b, are triangles with the sides of one severally equal to those of the other. Hence the angles A O B, a O b, are equal, whence the angles A O a and B O b are also equal. If then the sphere should revolve round an axis passing through O and the centre, A would be brought to a at the same moment at which B is brought to b; whence the change from (P) to (Q) can be effected, as asserted, by a simple axical revolution.

If then we suppose $a\,b$ ever so near to A B in position, the same thing is still possible, and by placing $a\,b$ infinitely near to A B, or finding the limit of the point O during a motion of the sphere which is diminished ad infinitum, the position of the instantaneous axis of repose may be determined at any point of the motion of the sphere. And if we suppose this sphere to be merely cut for convenience out of any solid body, with the fixed point of that body for its centre, the instantaneous axis of repose of the body may be found, being always that of the sphere.

One of M. Poinsot's remarkable propositions is the following:—Any motion of a system round a fixed point may be attained by cutting a cone (in the most general sense of the word) out of the body, with a fixed point for a vertex, and fixing in space another cone for it to roll upon, also with the fixed point for a vertex.

Thus, if in the adjoining diagram, the cone A be made to roll upon the cone B, both being supposed destitute of impenetrability, so that the contact of the curves of A and B can always be made,



and if the system out of which A is cut be then restored (also without impenetrability), there will be a complete geometrical representation of one possible motion of the system about C. Moreover, there is no possible motion which might not be represented in the same manner by properly choosing the cones A and B, and the axis of repose for the instant is the line in which the two cones touch.

If we suppose no fixed point in the system, so that motion of translation, as well as of rotation, is possible, M. Poinsot has given another equally distinct notion of the state of the motion during an infinitely small time. The most simple notion which we can form of a combined translation and rotation is the screw-like motion, in which a uniform motion of translation is accompanied by a uniform motion of rotation round a line parallel to the motion of translation. M. Poinsot has shown that every motion of a system must be, at any one instant, either a simple motion of translation, or one of rotation, or the screw-like motion above described. That is to say, at every point of time in the motion of a system there exists a line (whether internal or external to the *material* system matters not, as long as they are immoveably connected) along which the system is at that instant dropping, while all the rest of the motion at that instant is simple rotation about that *slipping axis*. There will perhaps be some difficulty in the first reception of these ideas; but when they are once understood, the precision they will give to the conception formed of the motion of a system will be found highly valuable.

ROTATION OF CROPS. It has been found from experience that a repetition of the same crops in succession has a peculiar effect on the soil, so that if grain of the same nature be sown year after year in the same ground, it will not produce the same return of the seed, even when abundantly manured. The reason of this has not yet been satisfactorily explained. It has been observed however that it is the formation of the seed which principally causes the deterioration of the soil; for if the crop be fed off in a green state, or mown before the seed is formed, the same may be safely repeated, and no diminution of the plants is apparent. Thus grasses in a meadow which are mown before the blossom is faded or the seed formed, will spring up again vigorously; but if the seed is allowed to ripen, the roots die away, and the best grasses gradually disappear. It is thus that when a meadow is mown year after year for hay, and the earliest grasses are allowed to ripen their seed, the crop will be later and later, and all the earliest grasses will disappear. Irrigation prevents this, and seems to restore to the land whatever the grasses require for their continuance. Feeding off the meadows does the same; and this leads to the conclusion that water restores the power of production; and that, the grasses not being permitted to run to seed, the deteriorating effect is not produced.

If it had been a mere exhaustion of the nutritious particles in the soil which caused the deterioration of the subsequent crops, some kind of manure might restore the fertility; but this is not the case. However judiciously the land may be manured, it is not practicable to raise a crop of wheat or clover, or of many other plants, on a soil which has shown that, as the farmers say, it is *tired* of that crop; but clover grows well after wheat, and wheat after clover, so that the same effect is not produced in the soil by these two crops.

In all countries where peculiar attention has been paid to agriculture, the most advantageous succession of crops is generally known; and certain general principles are commonly admitted as fully established. The chief of these is, that a plant with a naked stem and farinaceous seed should follow one with a branching stem and a fleshy root, which has been taken from the ground by mowing or feeding before the seed was ripe; or if all these conditions cannot be obtained, that some of them at least should be complied with.

Wheat sown after clover, which is allowed to be the best succession on light soils, fulfils all the conditions: when it is sown after beans, the condition of the preceding crop not ripening its seed is given up; and consequently this succession is inferior to the other. Potatoes, at first sight, appear to fulfil all the necessary conditions; but although they do not often ripen the seed above ground, the bulbs of the roots contain so much farina, that in the formation of these the soil is notoriously deteriorated; and farmers well know that, except in peculiar cases which form exceptions, wheat never thrives so well after potatoes as it does after clover, even when the ground has been so richly manured as to contain more organic matter in a soluble state than there is in the roots of the clover.

In order to find the crops which may advantageously succeed each other in rotation, many circumstances must be taken into consideration. First of all the quality of the soil, and its fitness for particular crops; next the wants of the farmer and his family, and the maintenance of the stock required to produce a sufficient supply of manure. It is unreasonable to expect poor light land to produce wheat and beans, although by high cultivation these crops may be forced. Rye, oats, and roots may give the farmer a better profit, by being raised at a less expense than more valuable crops, which must be forced with manure, and at best are precarious in soils not adapted to their growth. In moderate loams wheat may recur every fourth or fifth year, whereas in very rich compact loams it may recur every third, and even every alternate year. Clover and many artificial grasses do not succeed well if they recur oftener than every sixth year, or with even a longer interval. Rape, flax, and potatoes, require a still more distant recurrence on the same ground. Hence a knowledge of the crops suited to any particular soil, and the order in which these crops should succeed each other, is indispensable to the advantageous cultivation of a farm.

That which forms the food of man is always the principal object in the cultivation; and, excepting rice, which only grows in warm climates, there is no food more universally used than that which is made from wheat. Rye, barley, oats, and pulse, are only substitutes where wheat cannot be raised in sufficient quantities. Next to grain comes meat, chiefly beef, mutton, and pork, of which the consumption increases with the wealth of a nation and the advance of its agriculture. Wheat and fat cattle are therefore primary objects with every good farmer; and he who can raise most wheat and fatten most oxen or sheep or pigs will realise the greatest profit.

Of the old triennial course (fallow, wheat, barley or oats) it must be observed that the two corn-crops so rapidly deteriorate the soil, that a complete year of fallow is required to purify it, and a good manuring to keep the land in heart, and that all the industry of the farmer cannot keep up the fertility of the land without extraneous help, either from the manure made in towns or in the farm-yard by cattle bred and kept in commons or pasture-grounds. This system, which prevailed so long, cannot be called a rotation; and no real improvement was introduced into agriculture until the notion of its perfection was exploded, and tenants were permitted to deviate from it.

The Norfolk course (turnips, barley, clover, wheat), which is so well known and deservedly in repute for light sands, has only one defect, which is the too frequent recurrence of clover. Rye grass, the usual substitute in sandy soils, unless it be fed off young, is far inferior to clover as a preparation for wheat. Tares or vetches are a good substitute in heavy soils, as well as beans, but not well suited to light sandy soils. Peas are sometimes introduced; but they are apt to encourage weeds, unless the crop be very heavy, and then they exhaust the soil, and leave little vegetable matter behind them in their roots.

We have ourselves for many years adopted a rotation without being tied down to any positive rule, which has been suggested by circumstances. In a clayey loam on an impervious subsoil, but mostly completely drained, we have had turnips and Swedes on high ridges, tares, mangel-wurzel, potatoes, and a portion of rye to cut up green, succeeded by barley and oats sown with clover, rye-grass, and other biennial grass seeds. These were mown for hay the first year, and sometimes the second also, but generally depastured one year at least; then followed beans, and after these wheat. The green crops were put in after repeated and deep tillage, and with an ample allowance of manure. The whole of the layer was top-dressed with peat-ashes or coal-ashes in the first year, and what manure could be got or spared was put on the second year before winter, when it was ploughed up. All the corn crops were put in upon one shallow ploughing. We have had no reason to repent of pursuing this course; but we allow that one year only in clover would probably be more profitable. The land is not sufficiently fertile by nature to bear wheat after the first year of clover, instead of feeding or making it into hay. This would bring it to some of the rotations adopted in rich alluvial soils. It is a rule which should never be transgressed, that after every crop reaped there should be a remnant of manure sufficient to ensure a good crop the next year; and that this should always be in the land, and considered as stock in trade or capital invested at good interest. By means of judicious rotations and tillage a much greater quantity of produce may be raised at a certain expense of labour and capital than by any desultory and experimental mode of cropping. The farmer should find it his own interest to cultivate his land according to the most approved principles, and the landlord should impose only such restrictions as will prevent the tenant from injuring himself by diminishing the produce of his farm.

ROTATO'RIA. One section of the Infusorial animals is thus termed by M. Ehrenberg. It is arranged in the diploneurose division of the animal kingdom by Dr. Grant, a view which has been many times suggested to original observers, from the figure, division, and movements of the body. Ehrenberg's classification of these minute but often highly-organised creatures is formed

upon the same general model as that of the *Polygastrica*, there being in these the same double series of analogous nude and loricated forms.

General Character. — Swimming invertebral animals, apodal, often caudate, capable of executing rotatory movements by the aid of peculiar ciliated organs. No true heart, but a dorsal vessel, and transparent vessels in which no movements appear. No distinct branchiæ. Many nervous pharyngial ganglia (cerebral); in general a cervical nervous ring and an abdominal nerve. Very often eyes coloured red. Alimentary canal distinct and simple; sometimes a stomach, in other cases cœcal appendages; pharynx almost always armed with jaws, which often carry teeth. Sexual organs distinct, hermaphroditic; reproduction oviparous and viviparous, never fissiparous, as among *Polygastrica*.

As examples we may mention *Notammata centrura*, belonging to the *Rotatoria nuda*, and *Branchionus urceolaris*, belonging to the *Rotatoria loricata*.

ROTE, a musical instrument mentioned by the early French and English writers: it seems to have been similar to what the French call a *vielle*, and the English a Hurdy-Gurdy.

ROTHBURY. [Northumberland.]

ROTHER. [Sussex; Yorkshire.]

ROTHERHAM. [Yorkshire.]

ROTHSAY. [Buteshire.]

ROTIFERA. [Infusoria.]

ROTTBOELLA, a genus of the tribe of *Rottboelliaceæ*, of a natural and extensive family of grasses. The genus is distributed throughout Asia, especially India and the tropical islands, and is found also in Egypt. The species are not relished by cattle, with the exception of *R. glabra*, of which they are said to be fond.

ROTTECK, KARL WENCESLAUS RODECKER VON, was born on the 18th of June, 1775, at Freiburg-im-Breisgau, which now belongs to the Grand Duchy of Baden, but at that time was subject to the House of Austria. He received a good education, and in 1790 was admitted as a law student in the University of Freiburg. He took the degree of doctor of civil law in 1797, yet he always preferred history to law, and in 1798 was appointed professor of history at Freiburg. The first volume of his 'Allgemeine Weltgeschichte' (Universal History), was published in 1811; but it was not finished until 1827. After 1814 Rotteck made the constitutional law of Germany an object of particular attention, and in 1818 he obtained, in place of the professorship of history at Freiburg, the chair of politics and the law of nations. In 1819 he was chosen by his university as their representative in the first chamber of the states of Baden. In the same year appeared his 'Ideen über Landstände' (Ideas on Representative Bodies), a work distinguished by great historical learning, liberal views, and that lucid and attractive style for which he is remarkable among the German historians and publicists. The French Revolution of 1830 gave a fresh impulse to his political activity; and upon resigning his seat for the university, he was elected as their representative by the citizens of Freiburg, and as such sat in the second chamber. Rotteck's zeal in favour of political freedom brought persecution on him; and in consequence of a decree of the German Diet in 1832, the Baden government forbade Rotteck to lecture in Freiburg, and he was prohibited from editing any newspaper for five years. He still represented Freiburg from 1830 to 1840, in which year the Baden government allowed him to lecture again at Freiburg. But he died on the 20th of November, 1840, after a severe illness, aggravated by moral suffering.

Rotteck's great work, the 'Allgemeine Weltgeschichte,' has gone through many editions. The last edition is in 9 vols. 8vo., 1843; and there is a continuation of the work in two volumes by K. H. Hermes. Besides various other works, he was co-editor with Welcker of the 'Staats Lexicon,' or Political Dictionary, which was unfinished at the time of Rotteck's death. Rotteck is one of the best German historical and political writers.

ROTTEN STONE, a mineral, of a grayish, red, or dark brown colour, soft and earthy, consisting of—alumina, 86; silica, 4; and carbonaceous matter, 10. It is employed in polishing metals.

ROTTENHAMER, JOHANN, was born at Munich in 1564, and received instruction in painting from an artist named Donhaur or Donower. Early in life he went to Rome, where he first executed small historical compositions painted on copper in a style of most minute finishing, and he next undertook to paint a large altar-piece, representing several saints and a glory of angels, a work which, when completed, excited astonishment at the extent and versatility of his talents. This work he afterwards repeated for the church of Santa Croce at Mantua. He visited Venice, and studied the colouring of Tintoretto, whose style he imitated with great exactness. During his stay in Italy, which lasted several years, he was patronised by Ferdinand, duke of Milan, for whom he painted, amongst numerous works, a picture of Nymphs dancing, which was greatly admired.

He returned to his native country, and established himself at Augsburg. For the Emperor Rudolph II. he painted a fine picture of the Feast of the Gods. Many of his backgrounds were painted by John Breughel, and some by Paul Bril. There were eight of his pictures in the gallery of the Louvre, which were removed in 1815, and returned to Prussia, Holland, and Austria, whence they had been taken. Though greatly employed, Rottenhamer died in poverty at Augsburg, in 1604, or, according to Bryan, in 1606.

ROTTERDAM, the capital of the Dutch province of South Holland, is situated in 51° 55′ N. lat., 4° 29′ E. long., on the right bank of the Maas, about 20 miles from the mouth of that river, 12 miles S.E. from the Hague, and 44 miles from Amsterdam by railway. The city is built in the form of a triangle, the base of which, about a mile and a half in length, extends along the Maas. It derives its name from the little river Rotte, which runs through the middle of the city into the Maas. The town is surrounded by a

moat, and has six gates towards the land and four towards the water. The part called the Binnenstad or inner town has many narrow streets: it is separated by the High Street from the outer town (Buitenstad), which contains the fine houses of the rich merchants, and is intersected by numerous canals connected with the river, on which the largest merchantmen can come up and unload at the very doors of the warehouses. Along the Maas are many fine quays, the handsomest of which is called the Boomtjes, from the rows of trees with which it is planted. Rotterdam is connected by canals and by railway with the principal towns in Holland. The great church of St.-Lawrence contains the tombs of De Witte and several other Dutch admirals. There are many other churches and chapels, a synagogue, &c. The Exchange is larger and handsomer than that of Amsterdam. The other principal buildings are the town-house, a very ancient edifice, the admiralty, the academy, the theatre, the magazines of the East India Company, and some manufactories. The commerce of Rotterdam extends to all parts of the world, and embraces almost every kind of produce and manufacture. The imports and exports are similar to those of AMSTERDAM, but greater in quantity. The total value of the imports is about 10,000,000*l.* sterling; of the exports about 7,000,000*l.* Rotterdam is pre-eminently a commercial town, and is said now far to surpass Amsterdam in trading importance. Steamers ply regularly to Amsterdam, London, Cologne, Antwerp, &c. The town contains many valuable collections of works of art, an academy of sciences, a public library, and other useful institutions. Rotterdam is the birth-place of Erasmus, a bronze statue of whom, ten feet high, stands in the great market-place. The population is about 90,000.

ROTTERDAM, NEW, one of the Tonga or Friendly Islands, was discovered and named by Tasman (1643); its native name is Annamooka, or Namooka. The island is low, and surrounded by a sea with regular soundings, the depth varying from 25 to 30 fathoms. On the north-western side there is a roadstead in which Cook anchored in 1773 and 1777. [FRIENDLY ISLANDS.]

ROTTI. [SUNDA ISLANDS.]

ROTTLE'RA, a genus of plants belonging to the natural family of *Euphorbiaceæ*. The genus, which is found in the tropical parts of Asia and throughout India, contains handsome moderate-sized trees. *R. tetracocca* grows in Silhet, and yields a hard and valuable timber. The capsules of *R. tinctoria*, a native of the Coromandel coast, and extending to the forests of Northern India, are covered with short stiff hairs, which, when rubbed off, have the appearance of a powder of a fine red colour, which is employed in India in dyeing silk of a scarlet colour, and therefore forms an article of commerce in that country.

ROTUNDA, a term applied to buildings which are circular in their plan both externally and internally, or else to halls and other apartments of that shape, included within and forming merely a portion of the edifice containing them. The technical application of the term is however restricted to circular buildings whose height does not much exceed their diameter, for we should not describe a lofty cylindrical edifice, such as a round tower, by the term. The Colosseum in the Regent's Park, London, might without any great impropriety be classed among rotundas. The shape is now very seldom adopted, being unsuited to buildings in general, whatever their particular purpose may be, unless it be one for which nothing more than a single spacious hall or area is required internally. In ecclesiastical architecture circular and polygonal structures were by no means uncommon among the early Christians, especially for baptisteries and sepulchral chapels. The rotunda became afterwards in a manner incorporated with or added to the cruciform plan, being raised aloft and placed over that part of it where the transepts intersect the body of the edifice. Nearly all modern cupolas may be described as rotundas elevated above the rest of the building and viewed by looking up into them from below.

ROUBAIX. [NORD.]

ROUBILIAC, LOUIS FRANÇOIS, born at Lyon in France, came to this country, but it is not known at what period. The earliest notice of him as an artist is that he was recommended by Sir Edward Walpole to execute several busts for Trinity College, Dublin. He was afterwards employed on the monument of John, duke of Argyle, in which he was highly successful, and his practice was soon greater than that of the most popular artists of the day. Roubiliac's chief works are the monument of the Duke of Argyle, that of Sir Peter Warren, and of the Nightingale family, all in Westminster Abbey; those of the Duke and Duchess of Montague, in Northamptonshire; and one in memory of Bishop Hough, in Worcester Cathedral. His principal statues are of George I., at Cambridge; of George II., in Golden Square, London; of Handel, the composer, in Westminster Abbey; and those of the Duke of Somerset and Sir Isaac Newton, both at Cambridge. His busts are very numerous.

Of the high merit of Roubiliac there can be no doubt. At the same time many of his works are deficient in the repose, simplicity, unity, and breadth which are found to characterise the finest examples of sculpture. Roubiliac died Jan. 11, 1762.

ROUEN, the capital formerly of the duchy of Normandie, now of the French department of Seine-Inférieure, is situated on the right bank of the Seine, 87 miles by railway N.W. from Paris, 55 E. by S. from Havre, and has 110,000 inhabitants. The town existed in Roman times under the name of *Rotomagus*, which it retained till the 10th century. Under the Empire Rotomagus was the chief town of Lugdunensis Secunda. It suffered often from the incursions of the Northmen. About the year 876 it submitted to the famous Rollo, who fortified it, and who, on obtaining the cession of Neustria and Bretagne from Charles the Simple in 911, made Rouen his capital, which continued to be the residence of the dukes of Normandie till William the Conqueror mounted the throne of England. The murder of Prince Arthur by order of his uncle

John took place in Rouen, which city very soon after, in 1204, was taken by Philippe Auguste, and re-united, together with the rest of Normandie, to the crown of France. The town, besieged for six months in 1418–19 by Henry V., was bravely defended by the inhabitants, commanded by the gallant Alain Blanchard, but was at last compelled by famine to submit to Henry, who tarnished his success by the execution of Blanchard. For 30 years after this event the English held the city, which in that interval became the scene of the execrable judicial murder of Joan of Arc, who was burned on the spot that is now marked by a fountain, surmounted by a vile statue, in the Place de la Pucelle. In 1449 the city was recovered by Charles VII. after an obstinate siege, and has ever since belonged to the French. The most important points in the later history of Rouen are—its capture in 1562 by the Huguenots, who did great damage to several of the churches; its capture and pillage in the same year by the soldiers of the Duke of Guise; and its siege in 1593 by Henri IV, who invested the town for 8 months, and at last made himself master of it by the treachery of its governor.

The Seine opposite Rouen runs from S.E. to N.W. with a width of about 1000 feet, and a depth of 36 feet, enclosing the two small islands of La-Croix and Petit-Gay, which lie respectively off the south-eastern and south-western extremities of the town. Between these islets the river forms a good harbour for sea-borne vessels of 300 tons; and is spanned by two bridges, one a stone bridge, the central part of which rests on the south end of La-Croix islet, and is ornamented with a statue of Corneille, who was a native of Rouen; the other a suspension-bridge, which connects the city with the suburb of St.-Séver, on the left bank of the river, and opens in the middle so as to allow masted vessels to pass. At the southern end of the stone-bridge commences the Grand Cours, or principal public walk, which is shaded by four rows of fine elms, and extends about a mile up the left bank of the Seine. Above the stone bridge on the eastern side of La-Croix islet lie the large river craft and small steamers that ply up the Seine to Paris; between it and the suspension-bridge, and also below the latter, sea-borne vessels load and unload close to spacious well-built quays, extending all along the right bank of the river, and backed by lofty warehouses and handsome buildings mostly of recent erection. Leaving the quay at its south-eastern end near the botanic garden and the Champ-de-Mars, and at its south-western end near the extremity of the fine avenue of Mont Riboudet, on the Havre Road, runs the broad belt of the boulevards, which occupy the site of the old ramparts, and are lined with trees throughout their whole length, separating the old city of Rouen from its extensive and populous suburbs. The interior of the city is very ill-built; the streets are narrow, crooked, and dirty; the houses are constructed chiefly of wood, or of lath and plaster, and are very high; but as the rebuilding of houses with wood is now prohibited in the city, the number of these structures is slowly diminishing. Indeed, except the quays, a few of the squares, the suburb Cauchoise, and the adjacent west end of the town, Rouen has no tolerable street architecture. The suburbs generally are inhabited by the manufacturing population; they contain numerous cotton factories, and wider, not cleaner, streets than the town itself. But though Rouen resembles many old towns on the continent in presenting such a labyrinth of streets, composed of old picturesque timber-framed gable-fronted houses, it is not, like most of them, abandoned by trade, but still swarms with a population engaged in all the bustling activity of commerce and manufacturing industry; while in the splendour and beauty of its ecclesiastical and civic structures, most of which are associated with some stirring scene of the past, there are few cities of the same extent in any country that can have any pretensions to rival it. The cathedral of Nôtre-Dame, which was commenced in the 13th century, but not completed till the 16th, is a noble gothic edifice, built in form of a cross, and resembling the early English in its general architectural character. The interior, which is lighted through 130 magnificent painted glass windows, has a total length, including nave, choir, and Lady-Chapel, of 434 feet; the width is 104 feet; the height of the nave 89 feet; that of the aisles 45 feet: the transept, each end of which is lighted by a splendid rose window, has a length of 175 feet; at its intersection with the nave, rises to the height of 170 feet the lantern-tower, supported by four massive pillars, which sustain the basement of a beautiful pyramidal spire of cast iron, that springs to an elevation of 433 feet from the pavement, and weighs 512 tons. The west front is pierced by three deep portals, of which the central one projects before the others, and is surmounted by a pyramidal canopy of open stone-work that partly conceals a rose window of unrivalled beauty; it is crowned by a range of open screens of the most elegant tracery, and flanked by two towers of nearly equal height (245 feet), one exhibiting the grand simplicity of the early Norman, the other 'a thing of beauty,' in the richest pointed style, erected by Cardinal d'Amboise in 1509. Besides the Lady-Chapel the interior contains 24 chapels and several interesting monuments, among others those of Rollo, William Longsword, Louis de Brezé, grand seneschal of Normandié, and the cardinals d'Amboise. The monuments formerly erected in the choir to Charles V. of France and Richard Cœur-de-Lion, whose hearts were buried here, and the tombs of Richard's brother Henry, the great Talbot, and several others, were destroyed by the Huguenots; but the heart and mutilated statue of Richard were found in 1838, and are now deposited respectively in the sacristy and in the Lady-Chapel. The interior suffered much damage again in the revolution of 1793, when the library, the staircase leading to which is greatly admired, was plundered.

The abbey-church of St.-Ouen, a cruciform building, with a central and two western towers, and in dimensions nearly equal to the cathedral, is a noble building, which for unity of style (the

pointed gothic), and the harmonious symmetry of its different parts, is not surpassed by any other church in Normandie. The central tower, a model of grace and delicacy, composed of open arches and tracery, terminates in an octagonal crown of fleur-de-lis of most picturesque effect. The height of this tower is 256 feet. The churches of St.-Maclou, St.-Patrice, St.-Romain, St.-Vincent, and St.-Gervais, in the suburb Cauchoise, are the most remarkable among the other churches. Under the choir of St.-Gervais, which is the church of the abbey wherein William the Conqueror died, there is a crypt said to be 16 centuries old.

The chief civic structures are—the great clock tower, called Tour de la Grosse Horloge, erected in 1389, which is joined by a vaulted arch to the old town-hall; the present town-hall, which formed part of the abbey of St.-Ouen, but has a modern front supported on Corinthian columns, and contains the public library of 34,000 volumes, and a collection of paintings; the court-house, a fine old gothic building, completed in 1499, which contains some apartments of noble dimensions, among others the Salle des Procureurs, in which the parliament of Normandie used to sit: the great Halles or covered market-places, which occupy the site of the old palace, the scene of the murder of Prince Arthur, and form three sides of a square; over one wing is the great cloth hall (Halle aux Rouenneries), 295 feet long, 55 feet wide, and covered with a vaulted ceiling supported by stone pillars: the public fountains, the most graceful of which are those of Lisieux, La Crosse, and Croix-de-Pierre: the Bourgthéroulde Hotel, the exterior of which is ornamented with bas-reliefs, representing the meetings on the Field of the Cloth of Gold: the archbishop's palace near the cathedral: the theatre: the barracks: the custom-house and the consular buildings on the quay; opposite the latter is a statue of Boieldieu, who was a native of Rouen: the Hôtel-Dieu and the general hospital: the prison of Bicêtre, &c. &c.

Rouen gives title to an archbishop, whose suffragans are the bishops Bayeux, Évreux, Séez, and Coutances. It is the seat of a High Court and University Academy for the departments of Eure and Seine-Inférieure. Among the other public institutions are, tribunals of first instance and of commerce, a bank, a council of Prud'Hommes, a custom-house, a mint, an academy of science and art, a school of medicine, national and ecclesiastical colleges, assurance offices; schools of painting, sculpture, and architecture; a botanic garden; abattoirs; a museum in the suppressed convent of Sainte-Marie, which contains a rare collection of antiquities, works of mediæval art, and the finest specimens of glass painting perhaps in the world; a lunatic asylum; and a savings' bank.

The important manufactures of Rouen comprise striped and checked cottons for women's dresses, called *rouenneries*, calicos, woollen cloth, nankins, muslin, handkerchiefs, shawls, velvet, hosiery, swanskin, flannel, hats, lace, ropes, blankets, combs, preserved meats and confectionary, liqueurs, glue, soap, mineral acids and chemical products of all kinds, porcelain, pottery, room paper, haberdashery and small wares, steam machinery and mill-work, shot and sheet-lead, tinware, cotton and woollen yarn, &c. There are numerous cotton-mills, driven by steam and by water power; hand-loom weaving also prevails to a considerable extent. The other industrial establishments include dye-houses, sugar-refineries, bleach-works, tan-yards, breweries, ship-building docks, saw-mills, mills for grinding dye-woods, copper and iron-foundries, fulling and pressing-mills, &c.

Advantageously situated for commerce, with a good harbour, in which the influence of the tide is felt, and in rapid communication by railway with Paris, Havre, and Dieppe, Rouen has a very considerable import and export trade in its various industrial products, colonial and foreign produce, corn, flour, wine, brandy, fish oil, salt provisions, hides, groceries, drugs, raw cotton, hemp, wool, iron, slates, pitch and tar, timber, &c. About 100 vessels, including steamers, belong to the port. The annual value of exports from the city exceeds a million sterling; the imports do not exceed half the amount; this is exclusive of the transit trade. Rouen is a special entrepôt for colonial and foreign produce, and has one of the most important corn-markets in France.

(*Dictionnaire de la France;* Richard, *Recherches Historiques sur Rouen;* Gilbert, *Description Historique de l'Eglise Metropolitaine de Rouen, 2nd edit.*, 1841; Macgregor's *Statistics.*)

ROUERGUE, a former province of France, which formed the eastern part of the military government of Guienne, and now constitutes the department of Aveyron. Its chief towns were—Rhodez, Milhaud or Milhau, and Villefranche.

ROUFFACH. [Rhin, Haut.]

ROULERS. [Flanders, West.]

ROULOUL, the name of a bird whose position in the system has occasioned some difference of opinion among ornithologists.

Mr. G. R. Gray ('List of the Genera of Birds') places it in the subfamily *Perdicinæ*, between the genera *Ptilopachus*, Swains., and *Ortyx*, Stephens, which is its true position.

Generic Character.—Bill strong, stout, compressed, convex above, curved towards the point; nostrils longitudinal, placed in the middle of the bill, and covered by a naked membrane; orbits and lore naked; hind toe without any nail, not touching the ground; wings short; third, fourth, and fifth quills longest.

Locality.—India and its islands.

Example, *Cryptonyx cristatus* (*Cryptonyx coronatus*, Temminck). This is the *Rouloul de Malacca* of Sonnerat.

Description.—Male.—On the front a few long and floating hair-like appendages. A thick crest directed backwards covers the occiput: at its origin it is pure white, and then becomes fire-red. Forehead and upper parts of the neck blackish-blue, on which the red patch round the eye and that of the commissure of the bill are well defined. Upper part of the body emerald green, lower part rich azure blue; wings ruddy brown; bill lead-colour; and feet flesh-colour. Tail short and but little visible, its feathers black. Length about ten inches.

Female.—No crest, but only the isolated hair-like appendages of the forehead. Head and neck deep brown; the whole body uniform grass-green. Wings ruddy-brown, waved with brown.

Locality and Habits.—These beautiful birds haunt the great forests of Malaya, Sumatra, and Java. Wild and shy, they avoid the face of man, and are kept in captivity with great difficulty.

ROUND (*rotundus*, from *rota*, a wheel) is a term which is indiscriminately applied in common language to everything which has no very sharp corners. A cylinder and a sphere, a wheel and a ball, are equally styled round. In geometry, the sphere, cylinder, and cone, are sometimes denominated the three round bodies, and it would certainly add much to many persons' power of describing shapes if they would learn the meaning of the terms circular, cylindrical, conical, spherical, spheroidal, and annular, for all of which the term round is employed without any distinction.

ROUND, a short vocal composition in three or more parts, in the performance of which the first voice begins alone, singing to the end of the first part, then passes on to the second, and afterwards to the third, &c., the other voices following successively the same routine, till all are joined together, the round ending at the mark of a pause (𝄐) or at a signal agreed on. It differs from the CATCH.

ROUND TOWER. Numerous lofty towers, tapering from the base to a conical cap or roof, which crowns the summit, are found in Ireland, and are almost peculiar to that country. That they are of great antiquity appears from their having been considered ancient even in the 12th century, when the British connection with Ireland began. Had they been then in actual use, it is not probable that so accurate a writer as Giraldus Cambrensis, who had been in Ireland, and circumstantially describes them, should not also have mentioned to what purpose they were applied.

There are 107 of these towers, or the sites where they once stood, now known, and there is reason to believe they were formerly more numerous. Some of them are still perfect, and preserve their conical roofs; but only one, the Tower of Devenish, possesses the singular ornament of an obtuse crescent rising from the cone, and somewhat resembling what is called the Trident of Seeva.

The height of these towers varies greatly, one being only thirty-five feet, while the loftiest is one hundred and twenty, but the common range is between eighty and a hundred feet. Some stand on circular bases, which form one or two deep steps round the tower. In external character all the towers may be said to agree, since there is only one which does not taper, and in that case the tower is cylindrical throughout its entire height. There are nevertheless many striking differences in the mason-work and in the minor details.

The speculations of antiquaries as to the objects of rearing these mysterious towers have indeed been manifold—penitentiaries, the abode of anchorites, beacon-towers, alarm-posts, places of safety for goods, sepulchral stelæ, &c. Opinion seems now to incline to a belief in their having been erected after the introduction of Christianity, and probably for use as bell-towers.

ROUNDHEADS, a name given to the republicans in England, at the end of the reign of Charles I. and during the Commonwealth. The name seems to have been first applied to the Puritans because they wore their hair cut close, but to have been afterwards extended to the whole republican party. The Cavaliers, or royal party, wore their hair long.

ROUSSEAU, JEAN BAPTISTE, was born in Paris, April 6, 1670. His father gave him a liberal education. In 1688 he attended the French ambassador to the court of Denmark, and afterwards came to England with Marshal Tallard. On his return to Paris he devoted himself to poetry. His first productions consisted chiefly of satirical epigrams, most of which were pointed against contemporary writers. In 1694 his first comedy, 'Le Café,' was performed, with little success. This was followed by the operas of 'Jason, ou la Toison d'Or,' 'Venus and Adonis;' and the comedies of 'Le Flatteur,' and 'Le Capricieux;' all of which were more or less unsuccessful.

In 1703 Rousseau began to write his 'Sacred Odes,' in accordance with the solemn piety which Louis XIV. had rendered fashionable during the latter years of his reign. He is charged with composing licentious epigrams at the same time, to suit the taste of another class of his acquaintance. It was in consequence of some calumnious and indecent satires directed against his literary opponents, which Rousseau was accused of having written, that, in 1712, an arrêt of parliament, given 'par contumace,' condemned him to perpetual banishment from France.

From this time Rousseau's life was passed in various countries of Europe. He accompanied the French ambassador in Switzerland, the Comte de Luc, to Baden in 1714; and in 1715, when the Comte was appointed ambassador to Vienna, Rousseau went with him to that city, where he remained three years.

Rousseau's friends in Paris exerted themselves with so much success as to obtain for him letters of recall in 1716; but Rousseau refused to return unless a public acknowledgment was made of the injustice of his sentence. In 1721 he came to England, where he published a new edition of his works (1723, 2 vols. 4to.) which produced about 2000*l*. This sum he invested with the Ostend Company, which failed, and he again became dependent on his friends. He returned to Brussels, and was received under the protection of the Duke d'Aremberg, who in 1733 settled a pension upon him.

In 1738 Rousseau visited Paris incognito. But in a few months he returned to Brussels, where he died, March 17, 1741.

The most complete edition of his works (not including the licentious epigrams) was published at Brussels in 1743. Jean Baptiste Rousseau stands high among the lyric poets of France. His dramatic pieces are of little value.

ROUSSEAU, JEAN JACQUES, born at Geneva in 1712, was the son of a watchmaker.

After having received some education at a village school, he was apprenticed to an engraver, whose brutal treatment tended to produce idle habits, lying, and pilfering. At last, through fear of punishment for some act of misconduct, he ran away and wandered into Savoy, where, by the assistance of Madame de Warens, a Swiss lady, who had settled at Annecy, he entered the college of the Catechúmeni at Turin, and became a Roman Catholic. As he refused to take orders, he was dismissed from the establishment, and left to his own resources. He soon afterwards left Turin and recrossed the Alps, where he found Madame de Warens residing at a country-house near Chambery, who received him kindly, and afforded him support and protection in her own house during the next ten years. Of his foolish, profligate, and ungrateful conduct during a great part of this period he has given an account in his 'Confessions.' He quitted her finally in 1740, with letters of introduction for some persons at Lyon. He acted in succession as preceptor, musician, and private secretary to the French envoy to Venice, whom he followed to that city. From Venice he came to Paris, in 1745. On alighting at an inn, he became acquainted with a servant girl, Therèse Levasseur, with whom he formed a connection which lasted for the rest of his life. He attempted to compose music for the stage, but he did not succeed in selling it. His next employment was as a clerk in the office of M. Dupin, fermier général, where he did not remain long. In 1748 he became acquainted with Madame d'Epinay, who proved one of his steadiest and truest friends. At her house he formed the acquaintance of D'Alembert, Diderot, and Condillac, and by them he was engaged to write articles for the 'Encyclopédie.'

The Academy of Dijon offered a prize for the best essay on the question—'Whether the progress of science and of the arts has been favourable to the morals of mankind?' Rousseau determined to support the negative, which he did in a style of impassioned eloquence, and obtained the prize. His opera, 'Le Devin du Village,' was played before Louis XV., at Fontainebleau. Rousseau was in one of the boxes with a gentleman of the court. The king, being pleased with the opera, expressed a desire to see the author, but Rousseau fled from the interview, owing to a morbid shyness which he could not overcome.

In 1753 he wrote his 'Lettre sur la Musique Française,' which sorely wounded the national vanity. His next publication, a letter to D'Alembert, 'Sur les Spectacles,' gave rise to a controversy between them. He wrote also a 'Discours sur l'Origine de l'Inegalité parmi les Hommes.' In 1756 Rousseau, at the invitation of Madame d'Epinay, took up his residence at her country-house called l'Hermitage, at Montmorency, near Paris. Here he began to write his novel, 'Julie, ou la Nouvelle Heloïse,' which he finished in 1759. His 'Emile,' which appeared in 1762, contained a new system of education. In many respects Rousseau proved a benefactor to children, but as he proceeded in his plan for older boys, he became involved in speculations about religion and morality, which gave offence both to Roman Catholics and Protestants. The publication of his 'Contrat Social,' in which he developes his idea of the so-called rights of man, added to the outcry against him, in consequence of which Rousseau left Paris and repaired first to Yverdun, but the senate of Bern ordered him to quit the territory of the republic. He then went to Neuchâtel, of which Marshal Keith was governor for the king of Prussia. Keith received him kindly, and Rousseau took up his residence at Motiers in the Val de Travers, whence he wrote a reply to the archbishop of Paris, and a letter to the magistrates of Geneva, in which he renounced his citizenship. In his retirement he wrote the 'Lettres écrites de la Montagne.' This work increased the irritation against the author, who now removed to the little island of St. Pierre in the Lake of Bienne. Being sent thence by an order from the senate of Bern, he accepted the kind invitation of David Hume, who offered him a quiet asylum in England. Rousseau arrived in London in January, 1766, and the following March went to Wootton in Staffordshire, where Hume had procured him a private residence in the house of Mr. Davenport. It was not long however before Rousseau quarrelled both with Hume and Davenport, and suddenly returned to France.

After his return to France, Rousseau led an unsettled life, often changing his place of residence, till 1770. He published in the mean time a 'Dictionnaire de Musique,' which was considered to be both imperfect and obscure. He then returned to Paris, and took lodgings in the Rue Plâtrière, which has since been called Rue J. J. Rousseau. He now fell into a real or affected state of misanthropy, fancying that everybody was conspiring against him, and he complained at the same time of acute mental suffering. As he grew old and infirm, the labour of copying music became too irksome, and all his income consisted of an annuity of not quite 60*l*. The Marquis de Girardin offered him a permanent habitation at his château of Ermenonville near Chantilly. Rousseau accepted a detached cottage near the family mansion, whither he removed in May, 1778. On the first of July he went out as usual to botanise, but returned home fatigued and ill. The next morning he went to his room to dress, as he intended to pay a visit to Madame de Girardin, but he felt exhausted, and his wife coming in, he begged her forgiveness for any pain that he might have caused her, and said that he died in peace with all the world, and that he trusted in the mercy of God. He asked her to open the window, that he might once more behold the lovely verdure of the fields. 'How pure and beautiful is the sky,' observed he: 'there is not a cloud on it. I hope the Almighty will receive me there.' The most probable account is, that he committed suicide. (L. Blanc, 'Hist. de la Revol. Française,' ii. p. 7.) He was buried in an island shaded by poplars, in the little lake of the park of Ermenonville, and a plain marble monument was raised to his memory.

He had begun to write his autobiography when he was in England, under the title of his 'Confessions.' This work contains many exceptionable

passages. It ought to be observed however, that he did not intend it for publication until the year 1800, judging that the persons mentioned in it would then be dead; but through an abuse of confidence on the part of the depositaries of his MS., it was published in 1788.

Rousseau set to music about one hundred French 'Romances,' some of them very pretty, which he published under the title of 'Consolations des Misères de ma Vie.' He was passionately fond of music, though he seems not to have attained a profound knowledge of the subject.

There have been several editions of Rousseau's works: those of Lefevre, 22 vols. 8vo., 1819–20, and of Lequien, 21 vols. 8vo., 1821–2, are considered the best.

The town of Geneva has raised a bronze statue to his memory in the little island where the Rhône issues from the lake, which is a favourite promenade of the citizens.

ROUSSILLON, LE, a former province of France which now constitutes the greater part of Pyrénées-Orientales, derived its name from the Roman Ruscino, the ruined site of which marked by an ancient tower is now called Casteill-Roussillon. The province, originally inhabited by the Celtic Tectosagi (Livy, xxxviii. 19), was subjected to the Romans several years before the Christian æra, and formed part of Gallia Narbonensis under the Empire. After being subject to the Visigoths and Saracens successively, Roussillon rose to a sort of independence under its own counts, the last of whom, in 1178, bequeathed it to the kings of Aragon. These kings held Roussillon till 1462, when Juan II. ceded it along with the county of Cerdagne to Louis XI. Soon afterwards, in 1493, Charles VIII. restored it to Ferdinand of Aragon. In 1642 Louis XIII. wrested the province from Spain, and by the treaty of the Pyrénées in 1659 it was definitively reunited to France. Perpignan was its chief town. (Henry, *Histoire du Roussillon*, 2 vols. 8vo., 1836.)

ROVEREDO. [Tyrol.]

ROVIGNO. [Illyria.]

ROVI'GO, also called *Polesina*, a province in Austrian Italy, is bounded N. by the Adige, E. by the province of Venice, W. by those of Verona and Mantova, and S. by the Po. Its length is 35 miles from E. to W., and its greatest breadth is about 15 miles. The area is 428 square miles, and the population in 1843 was 144,615. The surface is flat, and is crossed by various canals, which communicate with the Po and the Adige. The province produces abundance of corn, rice, hay, hemp, pulse, and fruits. The principal towns are—*Rovigo*, the residence of the bishop of Adria, and the capital of the province, a bustling modern town, with about 7000 inhabitants, a collegiate church, a handsome government-house, a cathedral, and a chapel of the Madonna, in which are some good paintings: Adria: *Lendinara*, a town of about 5000 inhabitants on the Adigetto, 9 miles W. from Rovigo: and *Badia*, a small town W. of Rovigo and near the right bank of the Adige, with about 4000 inhabitants, who manufacture fine pottery.

ROVING. [Cotton Spinning.]

ROWAN-TREE, or ROAN-TREE, is a species of *Pyrus*, known also under the names of the Fowler's Service-Tree and Mountain Ash. Its Latin name, *P. aucuparia*, and its various modern designations, have been given to it on account of the general use made of its fruit for the purpose of decoying birds into traps. It is much cultivated, both on account of its valuable wood and rapid growth. It is found in most parts of Europe, in the north-west of Asia, in Nova Scotia, and other regions of the northern parts of North America, and in the island of Japan. It does not however attain equal magnitude in all climates. This tree has enjoyed from remote times a distinguished reputation. A belief in its power against witchcraft and evil spirits of all kinds, seems to have been prevalent at a very early date.

The Rowan Tree is a graceful tree, with an erect stem and orbicular head. It grows very rapidly for the first three or four years of its existence, and, on this account, it is well adapted for planting with young oaks, which it protects till they grow above it, when it is destroyed by their shade. It also forms excellent coppice-wood, the shoots being adapted for poles and for making hoops. The bark is used by tanners. In Wales it is as religiously planted in churchyards as the yew is in England.

The Rowan Tree will grow in almost any situation, being found on the sea-shore and the tops of mountains. Hence it is a valuable plant for growing in places exposed to the sea or in very open situations. It flourishes best in a free soil, near water, and in open airy spots, especially in a moist climate.

ROWE, NICHOLAS, was born at Little Beckford in Bedfordshire, in 1673. His father was a serjeant-at-law of some eminence. The son was educated at Westminster under Dr. Busby. At the age of sixteen he entered as a student of the Middle Temple; but did not pursue the profession of the law. When he was twenty-five years of age he produced a tragedy, called 'The Ambitious Step-Mother,' which was well received; and in 1702 appeared 'Tamerlane,' in which Louis XIV. and William III. are represented respectively by Bajazet and Tamerlane. This tragedy obtained great popularity, from its connection with the politics of the day. In 1703 was published 'The Fair Penitent;' and in the interval between this date and his death he wrote 'Ulysses;' 'The Royal Convert;' 'The Biter,' a comedy, which proved a failure; 'Jane Shore,' written professedly in the style of Shakspere, though with little of Shakspere's manner; and lastly, 'Lady Jane Grey.' He was undersecretary for three years when the Duke of Newcastle was secretary of state, and, after having been made poet-laureate at the accession of George I., he was appointed one of the land-surveyors of the customs of the port of London. He was also clerk of the council to the Prince of Wales, and was made secretary of the presentations by Lord Chancellor Parker, afterwards Lord Macclesfield. Rowe died December 6, 1718, aged 45, and was buried in Westminster Abbey. Besides the plays enumerated, he wrote short poems, a translation

of Lucan's 'Pharsalia,' and of Quillet's 'Callipædia.' In the composition of his dramas, Rowe shows little depth or refined art in the portraying of character, but his versification is fluent and graceful.

ROWLEY, WILLIAM, an English dramatic writer, of whose life little is known. He lived during the reign of James I., belonged to the royal company of players, and as an actor excelled most in comedy. Rowley wrote many plays, of which the following are the best known: 'A new Wonder, a Woman never vext,' a comedy, 4to., 1632. A tragedy, called 'All's lost for Lust,' 4to., 1633. 'A Match at Midnight,' a comedy, 4to., 1633. 'A Shoemaker a Gentleman,' a comedy, 4to., 1638. 'The Witch of Edmonton,' a tragi-comedy (in this he was assisted by Thomas Dekker, John Ford, &c.), 4to., 1658. 'The Birth of Merlin,' 4to., 1662. Several of his plays are printed in Dodsley's collection.

For notices of his life, see a copy of Langbaine's 'Dramatic Poets,' with MS. notes, in the British Museum, and some statements in Collier's 'Dramatic History.'

ROXANA. [Alexander III. *the Great.*]

ROXBURGH. [Roxburghshire.]

ROXBURGH, WILLIAM, M.D., a native of Scotland, who proceeded to India in the medical service of the East India Company, and distinguished himself by his attention to the botany of that country. In the early part of his career his attention was confined to Hindustan, as he was stationed at Samulcottah from the year 1781, where he paid particular attention to the cultivation of pepper. Into the plantations established for this purpose he introduced the coffee, cinnamon, nutmeg, annotto, bread-fruit tree, sappan-wood tree, and mulberry. He also endeavoured to introduce the culture of silk, as well as to improve the manufacture of sugar, and was remarkable throughout for the great attention which he always paid to the improvement of the resources of the country. He knew and corresponded with Kœnig, a pupil of Linnæus, who first gave an impulse to scientific botany in India. Dr. Roxburgh made large collections of plants in the Carnatic, but he had the misfortune to lose them all, with his books and papers, in an inundation at Injeram. He however recommenced making a fresh collection, and the Court of Directors sent him out a present of botanical books.

In the autumn of 1793, from his great merits, he was removed to Calcutta, where he was appointed superintendent of the botanic garden which had been established by Colonel Kyd. In the midst of zealous and energetic labours in botanical science, he was compelled to make three voyages for the recovery of his health; and on the last of these voyages, in 1815, he died.

His works, descriptive of 3500 plants, and including drawings to the amount of 2000 new plants of his own discovery, were published some years after his death under the superintendence of Sir J. Banks.

ROXBU'RGHIA, a genus of plants named in honour of Dr. Roxburgh. There are only two species of the genus, *R. gloriosoides*, a native of the moist valleys of the Indian peninsula; and *R. viridiflora*, discovered in the Chittagong district by Dr. Hamilton, and said to have long trailing stems, sometimes one hundred fathoms in length. The same species seems to be found also in Siam, Cochin-China, and the Moluccas.

ROXBURGHSHIRE, a county of Scotland, situated on the south-eastern border, extends between 55° 5′ and 55° 42′ N. lat., and 2° 11′ and 3° 8′ W. long. It is bounded N. by Berwickshire, E. and S.E. by Northumberland, S. by Cumberland, S.W. by Dumfriesshire, W. by Selkirkshire, and N.W. by Edinburghshire. Its form is very irregular: the greatest length N.N.E. to S.S.W. is 43 miles; the greatest breadth at right angles to the length is 30 miles. Its area is 227 square miles. The population in 1841 was 46,025.

Surface, Geology, and Rivers.—The whole surface of the county is undulating; but in the northern and central parts the hills are of less elevation than along the English and Dumfriesshire borders. A range of lofty hills extends from the eastern extremity of the shire S.W. along the border of Northumberland, to which the general designation of Cheviot Hills, properly applicable only to a part of the range, is sometimes given. Some of these hills are about 2000 feet high. This range separates the basin of the Tweed from the basins of the Coquet and the Tyne. From the head of the Jed Water the range of hills turns westward and runs through the county into Dumfriesshire, separating the basin of the Tweed from that of the Eden. From each side of the range, hills irregularly grouped overspread a wild pastoral district, drained by the upper waters of the Teviot on the one side, and the Liddel on the other.

The eastern side of the county is chiefly occupied by the formations of the red marl or new red sandstone group; the western side by the grauwacke rocks; the Cheviot or border hills are chiefly of trap formations; and Liddesdale is occupied by the coal measures. Limestone is procured in some parts of the county; in Liddesdale it is abundant.

The county belongs almost entirely to the basin of the Tweed. Liddesdale alone belongs to that of the Eden. The Tweed itself first touches the border of the county at the junction of the Ettrick Water; and flowing E. quits the county about 5 miles W. from the town of Coldstream in Berwickshire.

The principal affluent of the Tweed is the Teviot, which flows through the county in nearly its whole extent, giving to the greater portion of it the name of Teviotdale. The Teviot rises in the hills on the S.W. border towards Dumfriesshire, and flows with a very direct course N.E., past Hawick and Denholm, to Eckford, where it turns N. and joins the Tweed at Kelso. Its whole course may be estimated at from 36 to 38 miles. It drains nearly the whole county, receiving several small affluents from the Northumbrian border, from the range which separates Liddesdale from the rest of the county, and from the border of Selkirkshire. The Ettrick, the Gala, the Leader, the Eden, and other small

affluents of the Tweed, have part of their course in this county. Liddesdale is drained by the Liddel and the Hermitage, a tributary of the Liddel, with some smaller streams, all of which belong to the basin of the Cumbrian Eden. The Liddel receives all the other streams of Liddesdale, and joins the Esk, which falls into the same æstuary as the Eden. None of the streams are navigable, except for ferry-boats or other very light boats.

The Dalkeith and Hawick Branch of the North British Railway enters the county from Edinburgh at Galashiels and extends to Hawick.

Soil and Agriculture.—The soil in the western parts of the county is generally a thin cold wet clay. A poor sandy soil, intermixed in the higher grounds with peaty matter, usually characterises the districts occupied by the coal measures. The red sandstone district is marked by a deep rich red soil, producing its harvest rather early; but where the sandstone is more siliceous and loose, the surface is covered with a barren sand. The trap and porphyry district is usually covered by a loose, light, warm, and dry soil, except in the bottoms, where there is usually a deposit of rich strong clay loam. The highest parts of the trap district afford the finest sheep pasture in the county.

About one-third of the county is under tillage; of the remainder a small part is moor-land, and another small portion wood-land; but by far the greater part is occupied as sheep walks. It is supposed that the quantity of arable land has increased one-third within the last fifty years. The favourite breeds of sheep are the Cheviot for the hill pastures, and the Leicester or long-woolled for the lower grounds. A cross between these two is found to answer very well. The most common sort of stock is the Teesdale or short-horned, but the Ayrshire and the Highland kyloe are also kept; and the small farmers and married farm-servants have sometimes a mixed breed of milch cows, produced by crossing the Teesdale with the Ayrshire, or the Galloway with the Highland. Swine are reared by cottagers, farm-servants, tradesmen, and others, but they are not kept to any extent by the farmers. Poultry are kept by the same classes of persons as pigs. There are some very productive orchards in the neighbourhood of Jedburgh, Kelso, and Melrose.

Divisions and Towns.—Roxburghshire is divided into four districts. The county returns one member to parliament.

The following are the principal towns, with the population of each in 1841:—

Castletown is about 18 miles S. by E. from Hawick. It consists of two long streets parallel to each other, lined with neat houses, on the right bank of the Liddel. The parish church is at the junction of the Hermitage with the Liddel, above a mile from the town. The castle is a massive border fortress, of which the walls are remaining. Population of the town, 1030.

Hawick is a burgh of barony about 10 miles S.W. from Jedburgh, and 53 miles S.S.E. from Edinburgh by the Dalkeith and Hawick Branch of the North British Railway. It is situated on the right bank of the Teviot, at the junction of the Slitrig, which flows through the town. The town consists chiefly of one long spacious street along the bank of the Teviot, which is here crossed by a stone bridge. There are two bridges over the Slitrig, one of which is very ancient. The streets are well paved, and lighted with gas. The manufactures are chiefly of woollen yarns, flannels, and other woollen under-clothing, plaiding, shawls, tartans, druggets, woollen-cloths of various descriptions, blankets, and lamb's-wool hosiery. Population of the town, 5770.

Jedburgh (colloquially Jeddart or Jethart) is a royal burgh about 11 miles N.E. from Hawick. The town stands in a narrow valley on the left bank of the Jed. It consists of several streets, converging in the market-place in the centre. There are several houses on the right bank of the river, forming a kind of suburb. There are three bridges over the Jed, and others over one or two small burns or brooks running into it, all in or near the town. The principal streets are sufficiently spacious. The town contains a county-hall and a county prison (including a gaol, bridewell, and debtors' prison, with a house for the governor). The principal manufactures are of woollens, such as blankets, flannels, tartans, shawls, shepherds' plaidings, hosiery, lamb's-wool yarn, and carpets. There are quarries of red and white sandstone in the parish and several corn-mills. On the south side of the town are the ruins of Jedburgh Abbey. Jedburgh is included in the Haddington Parliamentary District. Population of the town, 2697.

Kelso is a burgh of barony 11 miles N. by E. from Jedburgh, on the north bank of the Tweed, which receives the Teviot just opposite the town. The town consists of several streets converging in an open square, and extends for about half a mile along the Tweed. The old houses, with gables to the street, have very generally given way to more modern buildings of freestone, roofed with slate, giving to the town a very handsome appearance. The ruins of the Kelso Abbey Church are of mingled architecture, chiefly Norman. There are two modern churches: the one most recently erected is on the north side of the town, and is very handsome; it is in the Elizabethan style, with a tower 70 feet high. There is a bridge over the Tweed 494 feet long, with 5 elliptical arches of 72 feet span. The town-house is a neat modern building on the east side of the square. The manufactures of Kelso are not important; they consist of leather, linens, stockings, hats, woollen cloth, and tobacco. Population of the town, 4594.

Melrose is a burgh of barony on the south bank of the Tweed, 11 miles N.W. from Jedburgh. In A.D. 1136, David I. of Scotland founded here a Cistertian abbey, the ruins of which yet remain. The original Saxon monastery was on a site nearly surrounded by the Tweed, three miles to the east of the ruins of the later abbey. These ruins are well known from the description in Sir Walter Scott's 'Lay of the Last Minstrel.' The town consists of a central triangular space with streets diverging from it. The place has an air of antiquity; and some of the houses have in their walls

stones with inscriptions derived from Catholic times. Some good modern houses have been built. There are two stone bridges over the Tweed in the parish, but neither of them near the town, and a suspension-bridge for foot-passengers and single horses. There is no manufacture but that of woollens. Population of the town, 893. Abbotsford, the residence of the late Sir Walter Scott, is in the parish of Melrose, two or three miles west of the town.

Roxburgh, formerly a town of importance, now a very small village, is situated about 3 miles S.W. from Kelso. There are some portions remaining of the very thick and strong walls of Roxburgh Castle. The old town was burnt down, and none of it remains.

History and Antiquities.—In the earliest period of authentic history the county seems to have been comprehended in the territories of two ancient British nations, the Gadeni in the west, and the Otadeni in the east. Of these Celtic nations the cairns and barrows, or tumuli, and other sepulchral antiquities which have been found, are supposed to be relics. Druidical stones, some of them arranged in circles, are found; and the Eildon Hills and other eminences are crowned with forts. On the conquest of this part of the island by the Romans, the county was comprehended in the province of Valentia, and Roman roads were carried across it, and Roman stations established within it.

On the departure of the Romans this county was exposed to the attacks of the Angles, who founded the Northumbrian kingdom. The natives struggled long and gallantly, and it is to this period that Chalmers ascribes the construction of the Catrail, a vast ditch with a rampart, extending from near Galashiels in Selkirkshire, to Peel Fell on the border of Northumberland, forty-five miles, of which eighteen are in Roxburghshire. But the Angles gained ground, and before the end of the sixth century occupied Teviotdale, which became part of the kingdom of Northumbria. In the tenth century it was relinquished by the Anglo-Saxons to the King of Scotland, together with the rest of the Scoto-Northumbrian territory comprehended under the general name of Lothian. From this time the county was gradually strengthened by castles and towers against that hostility to which its situation on the border peculiarly exposed it. Jedburgh Castle was erected in the time of David I., and is the earliest in the county of which any distinct account can be given. Roxburgh Castle was perhaps of as early date, and at one time of greater importance. Hermitage Castle was built during the reign of Alexander II. (1214-49). The ecclesiastical ruins are the abbeys of Kelso, Jedburgh, and Melrose. There are remarkable caves at Jedburgh, Roxburgh, and Anerum, which appear to have been used as habitations, probably as temporary retreats during the border wars.

ROYAL ACADEMY OF ARTS IN LONDON. At the accession of George III., painting, sculpture, and architecture, notwithstanding there were eminent artists in all these branches, were in a lower state in Great Britain than in most parts of Europe. The young king however soon began to show a strong disposition to encourage the arts. The study of architecture under Mr. (afterwards Sir William) Chambers became his favourite recreation, and the Archbishop of York introduced to his notice Benjamin West, a young American artist just returned from his studies in Italy, to whom the king thenceforward allowed a liberal pension.

An institution which had been formed in 1754, called 'A Society for the encouragement of Arts, Manufactures, and Commerce, in Great Britain,' was the first which included among its objects the offering of rewards to the fine arts. Attempts were made about the same time by the principal artists to form a permanent academy for the cultivation of painting, sculpture, and architecture, which failed. In 1760 however, with the assistance of the above-mentioned Society, who liberally allowed the use of their great room for the purpose, the artists were enabled to open the first public exhibition, which, though not entirely satisfactory to the promoters, attracted great attention, and was for several seasons successfully followed by a similar display of their talents. They were in consequence induced to apply to the king for a charter, which they readily obtained, and in 1765 they were constituted a body corporate under the title of 'The Incorporated Society of Artists.' This body was soon found to be of too miscellaneous a character, and the members too numerous to render their admission any mark of merit; schisms arose, and the principal artists withdrew, and the members endeavoured to obtain the patronage of the king. W. Chambers, F. Coates, G. M. Moser, and B. West presented to him a memorial signed by twenty-two artists, the purport of which was to show the probability that, with his royal sanction and encouragement, and by means of an annual exhibition of their works, they would soon be able to raise sufficient funds for the support of a gratuitous national school of art. The proposal was graciously received. The plan of a constitution was drawn up by Mr. Chambers, and laid before the king, which he approved, and signed on the 10th of December, 1768. Thus was founded 'The Royal Academy of Arts in London, for the purpose of Cultivating and Improving the Arts of Painting, Sculpture, and Architecture.'

Among the artists who signed this memorial were:—West, Zuccarelli, Dance, Wilson, Cipriani, Angelica Kauffman, F. Bartolozzi, Paul Sandby, and Chambers. These, with others, among whom were Gainsborough, Reynolds, Thomas Sandby, George Dance, and Johann Zoffani, composed the original thirty-six academicians. The number, forty, was not completed till 1780—by the addition of Edward Burch, Richard Cosway, Joseph Nollekens, and James Barry. Their first meeting was held on Dec. 14, 1768, when the following officers were elected, namely, J. Reynolds, *President;* G. M. Moser, *Keeper;* F. M. Newton, *Secretary;* E. Penny, *Professor of Painting;* T. Sandby, *Professor of Architecture;* J. Wall, *Professor of Perspective;* Dr. William Hunter, *Professor of Anatomy.* The king appointed Chambers *Treasurer*, and Wilson *Librarian.*

This list of the founders of the Royal Academy evidently includes the great mass of talent existing at that period in London.

The king's adoption of the artists was immediately followed by the most liberal and effective support. He caused apartments for the schools to be fitted up in old Somerset House, supplied the Society with rooms in Pall Mall for their exhibitions, and for several years made up every deficiency in their expenditure from his privy purse. When old Somerset House was purchased by the nation as a site for a number of public offices, the king took care to reserve a portion of the new building for his academy.

In 1776 the plans of a new site were submitted to the approval of the president and council, and the apartments devoted to this purpose were fitted up with a degree of magnificence worthy of a royal palace, the talents of many of the principal members having been employed in its decoration. In July, 1780, the preparations being completed, the Royal Academy obtained possession of their new residence, by an order from the Treasury to the surveyor-general of the works; and their first exhibition in Somerset House took place in the following year. On the death of George III., the Academy solicited his successor to honour them with the same patronage which they had received from his predecessor. George IV. readily consented to adopt the Royal Academy, and, in furtherance of the views of its founder, placed himself at the head of the institution, and thenceforward gave the sanction of his signature to such of their proceedings as required it. He also presented them with a large and highly-valuable collection of casts from the finest antiques, which were procured from Rome by the intervention of Canova.

On the death of George IV., his successor, William IV., immediately extended his patronage to the Royal Academy. He entered cordially into the views of his royal father, received the officers with promptness, and attended with great kindness to their wishes on all occasions.

In 1834, a proposal having been made by Lord Grey and the existing ministry to transfer the establishment from Somerset House to Trafalgar Square, where an edifice was proposed to be raised which would be large enough for a national gallery of paintings, and at the same time offer better accommodation to the Royal Academy. The apartments were put into their possession in 1836, in a very unfinished state, and wholly devoid of such decoration as might have been expected in an academy of the arts. The removal has been attended with great expense to the Society, and in many respects they have been disappointed in their expectation of improved accommodation.

Upon the accession of Her present Majesty, and a representation of the position of the Academy with relation to her royal predecessors, the Queen adopted the Royal Academy, consented to become its head, to grant the same privileges of a private audience to its officers, and to sign such of their proceedings as require the royal sanction.

The Royal Academy consists of forty academicians, painters, sculptors, and architects. There

is a second order of members, styled associates, twenty in number, from whom alone the vacancies that occur among the academicians are supplied. The body of academicians elect, but the approbation and signature of Her Majesty are necessary to make this election valid.

There are also six associate engravers. Associates are elected by the body of academicians, from a list of exhibitors who declare themselves candidates for this honour.

There are a treasurer and a librarian. A bye-law of the Academy requires that they shall be academicians. These offices are filled by Her Majesty's nomination.

There are also a keeper and a secretary. These offices are filled by election, with the approbation of Her Majesty.

There are four professors (academicians) elected by the general assembly, and approved by the Queen, who read lectures on painting, sculpture, architecture, and perspective.

There is a professor of anatomy, elected by the academicians, with the approbation of Her Majesty.

There are three schools: a school for study from casts from celebrated works of antiquity; a school for study from living models; and a painting school. The first is under the care and direction of the keeper, and the other two are under the care of visitors, annually appointed.

The council consists of nine members, including the president, and has the management of all the concerns of the Society. All bye-laws of the Academy must originate in the council, and have the approbation of the general assembly and the sanction of Her Majesty's signature to give them effect.

The president, council, and visitors are annually elected, and confirmed by Her Majesty's signature.

There are also several honorary members of the Royal Academy, namely, a professor of ancient literature, a professor of ancient history, a chaplain of high rank in the church, an antiquary, and a secretary for foreign correspondence, elected by the general assembly and approved by the Queen.

All persons are admissible as students of the Academy. Nothing but indication of talent and a respectable character are required from them. Their names remain unknown till judgment is passed on the specimens which they send in, and when admitted they receive a gratuitous education from the best masters.

All painters, sculptors, or architects, whose works show sufficient merit, are allowed to exhibit with the Academy, and, being admitted exhibitors, they are immediately eligible as associates. Many young artists whose great abilities have promised to contribute to the credit and support of the institution, have been chosen associates, and soon afterwards academicians, though they had scarcely left the schools.

The executive government of the Academy passes in rotation to all the academicians, and half the council retires, and is renewed annually.

The operations of the Academy are continued in regular succession throughout the year, excepting vacations of a month in September and a fortnight at Christmas. Unfortunately the neces-

sity of giving up the only room fit for an antique academy to the annual exhibition of sculpture renders the cessation of that school during the exhibition still unavoidable.

The schools of drawing, painting, and modelling, are open daily from ten to three and from six to eight, under the direction of the keeper and visitors. A practical course of lectures on perspective is given during the spring. The lectures on anatomy are delivered before the Christmas recess; those on painting, sculpture, and architecture, are given twice a week, from January to the end of March. The library is open three times a week.

Prizes are annually given to encourage meritorious students, and those who have gained the biennial gold medal have from time to time an opportunity of being sent abroad to study for three years at the expense of the Academy.

Among the chief improvements in the practical working of the Academy, besides the professorship of sculpture, may be reckoned the institution of a school of painting, which is under the superintendence of a special officer. It is attended twice a week by visitors, who are appointed from among the academicians for that purpose, and premiums are annually awarded to the successful students.

The library of the Academy is continually improving, and it now contains all the best works on art, besides a considerable number of modern prints, and a valuable collection of engravings of the Italian school from the earliest period, formed by George Cumberland, for which they paid 600*l*. On the death of Sir Thomas Lawrence, the Academy purchased his collection of architectural casts for 250*l*. (although their apartments could not accommodate them), and presented them to the British Museum, where they are well arranged for the benefit of students.

ROYAL ASSENT. [Assent, Royal.]

ROYAL SOCIETY (*of London*), consists of a number of persons associated together for the purpose of promoting mathematical and physical science. It owed its origin to the association, in 1645, of several learned men in London, among whom the most eminent were Dr. (afterwards Bishop) Wilkins, Dr. Wallis, and Mr. Forster. In 1652 Drs. Wilkins and Wallis removed to Oxford, and established a similar association there, which was joined by Drs. Seth Ward, Petty, Bathurst, and Willis. In 1659 the two societies united, and held their meetings in London. At that time the lectures on astronomy and geometry in Gresham College were delivered, the former by Mr. Christopher Wren, and the latter by Mr. Rooke; and these gentlemen, together with Lord Viscount Brouncker, Mr. Brereton (afterwards Lord Brereton), Sir Paul Neile, Mr. John Evelyn, Mr. Balle, Dr. Croone, and others, besides the Oxford members, used after the lectures to assemble for philosophical conversation in an adjoining room. After the Restoration, formal rules were drawn up for the government and support of the association. The subscriptions were fixed at one shilling weekly from each member, and ten shillings entrance-fee; the elections to be by ballot. In 1662 Charles II. granted a charter, by which the members were incorporated into a Society consisting of a president, council, and fellows, under the name of the Royal Society, and William Viscount Brouncker was appointed president. This charter being found not sufficiently explicit, in the following year another was obtained, in which the president and fellows are designated the 'President of the Council and the Fellows of the Royal Society of London for promoting natural knowledge.' In 1663 his Majesty bestowed a mace on the Society, and in 1664 he signed himself, in the Charter-Book, its founder; at the same time the Duke of York (afterwards James II.) signed himself a fellow.

The Royal Society of London may be said to have been then completely formed, and it must be considered as the oldest of its kind in Europe, if we except the Academy of the Lyncei at Rome.

From the time of the charter being granted, the business of the Society assumed more importance, and in 1664 Mr. Hooke was appointed curator. The first portion, or number, of the 'Philosophical Transactions,' as the work which the Society published was designated, appeared on Monday, March 6, 1665. The Society had hitherto met in Gresham College, but the great fire of 1666 having compelled the authorities of the city to take possession of the rooms hitherto occupied by the Society, the latter accepted the offer of apartments in Arundel House, and it met there for the first time in January, 1667. In October, 1674, at the invitation of the Gresham professors, the Society returned to its former apartments in that college. In 1701 the Society removed to a spacious house which it purchased in Crane Court, Fleet Street. This house afforded room for the meetings, for the library, and for the museum of curiosities; and here the reading of papers and the exhibition of experiments took place as before, till the year 1782, when the government assigned to the Society the apartments which it now occupies in Somerset House. The library is now very extensive, and a catalogue of the scientific books forms a thick octavo volume.

In 1703 Sir Isaac Newton was appointed president of the Society, and this honourable post was held by the greatest of philosophers till his death in 1727. The experiments of Newton on telescopes and on light and colours were amongst the first subjects which gave a value to the 'Transactions' of the Society. The 'Philosophical Transactions' were at first published in monthly numbers: these were afterwards collected into volumes, and, from the commencement in 1665 to the year 1800, the work consisted of 90 volumes. From that time a volume has come out annually.

Honorary recompenses have been liberally bestowed by the Society on persons distinguished by their discoveries in pure science or in philosophy. For this purpose it has received several large bequests. The prize is given in the form of a gold and a silver medal, both of which are struck in the same die.

According to the present statutes of the Society,

every candidate for admission must be recommended by a certificate in writing, signed by six or more fellows, of whom three at least must certify that the recommendation is from personal knowledge; and the name, qualifications, &c., of the candidate must remain in the meeting-room of the Society during five ordinary meetings before he can be put to the vote. The votes are taken by ballot, and the person cannot be elected unless two-thirds of the number present vote in his favour. The person elected must appear for admission on or before the fourth ordinary meeting of the Society after his election; and previously to such appearance he must pay the sum of 10*l.* for admission money; he must also pay 4*l.* per annum as long as he continues a fellow of the Society; but the annual payments may be compounded for by paying at once the sum of 60*l.*

The ordinary meetings of the Society are held once a week, from November till the end of Trinity Term, at half-past 8 P.M., in the apartments at Somerset House.

The Royal Society of Edinburgh was incorporated by a charter in 1783; though, under the name of the Philosophical Society of Edinburgh, the association had existed since 1739, in which year it was formed by the influence of Mr. Maclaurin and other learned men in the metropolis of Scotland. In 1811 the Society obtained a new charter, by which it was impowered to form a library and a museum. A volume of its 'Transactions' comes out as often as the number of papers which are thought worthy of being printed are sufficient to make one.

ROYALTY. The French words *roi* and *royal* correspond to the Latin words *rex* and *regalis*; and from *royal* has been formed *royalté* (now *royauté*); whence has been borrowed the English word *royalty*. The corresponding Latin word is *regalitas*, which occurs in the Latin of the middle ages.

Royalty properly denotes the condition of a person of royal rank, such as a king or queen, or reigning prince or duke, or any of their kindred. The possession of the royal condition does not indicate that the possessor of it is invested with any determinate political powers; and therefore *royalty* is not equivalent to *monarchy* or *sovereignty*. A royal person is not necessarily a monarch; or, in other words, does not necessarily possess the entire sovereign power. The powers possessed by persons of royal dignity have been very different in different times and places; and have varied from the performance of some merely honorary functions to the exercise of the entire sovereignty. [KING; SOVEREIGNTY.]

In popular discourse *royalty* is made equivalent to *monarchy* or *sovereignty*; and a king is called monarch or sovereign without any reference to the fact whether he possesses the entire sovereign power or only a portion of it.

ROYAN. [CHARENTE INFE'RIEURE.]

ROYDSIA, an Indian genus of plants allied to the natural family of *Capparideæ*. The genus consists of a single species indigenous in the forests of Silhet, where, with a stout stem and numerous branches, it climbs over the trees to a great extent, and flowers in the month of March, diffusing a strong but pleasant odour from its numerous blossoms.

ROYE. [SOMME.]

RO'YLEA, a Himalayan genus of plants, of the natural family of *Labiatæ* and tribe *Ballotææ*. The plant forms a handsome shrub, with many branches and an abundance of pale-green glaucous leaves. *R. elegans*, the only species known, is employed by the natives of the mountains where it is indigenous as a febrifuge. It is suited to the shrubberies of this country.

ROYSTON. [HERTFORDSHIRE.]

ROYSTON CROW, the common English name for the Hooded Crow, *Corvus Cornix*, Linn.

Description.—Male.—Head and the whole body fine gray-ash colour; throat, wings, and rounded tail, black with browned reflections; bill and feet black; iris brown. Length about 22 inches.

Royston Crow (*Corvus Cornix*)

Female.—Less than the male; the black on the throat not so extensive in front as it is in him; reflections of the wings and tail less vivid; and the gray of the body more clouded with rusty hue.

The young assume the colour of their parents at an early period.

This is the *Mulacchia, Munacchia, Cornacchia,* and *Corvo palumbino* of the Italians; *Corneille sauvage* and *Corneille mantelée* of the French; *Grau-Krähe* and *Nebel-Krähe* of the Germans.

Habits, Food, &c.—The sea-shore and the banks of tidal rivers are the favourite haunts of this species, though they are frequently found far inland, and animal substances are preferred by them as food. Sand-worms, shell-fish, crustaceans, and other animal matters left by the retiring tide, seem to be most welcome to them. They appear to be both knowing and affectionate. Mr. Selby repeatedly observed one of these birds to soar up to a considerable height in the air with a cockle or muscle in its bill, and then drop it upon the rock in order to obtain the included fish. The nest is generally built in trees; but, in their absence, among rocks and deep chasms in hill sides. Mr. Salmon, who found it in the last-mentioned

localities in Orkney, describes the outside of the nest as composed of withered heather and large roots or stalks, and the lining as being of wool and hair: the three young in one nest which he looked into, were of the same colours as the parents. The eggs, four or five in number, are greenish, mottled with dark brown.

The geographical diffusion is very extensive over Europe and Asia. Temminck states it to be common in Japan.

The Hooded Crow and the Common Carrion Crow have been not unfrequently known to breed together and rear a hybrid progeny.

RUABON. [DENBIGHSHIRE.]

RUAULT, JEAN, more generally known by his Latin name Rualdus, was born at Coutances, in Normandy, about 1580. He was for several years professor of classical literature at the University of Rouen; whence he went to Paris. He was twice rector of the university of Paris, and in 1629 he succeeded Frederic Morel as Professor of Belles Lettres in the Collège Royal. He died in 1636. The work by which he is best known is a valuable edition of Plutarch. The best copy of it is that printed at Paris, 1624, 2 vols. folio. On account of the rarity of this edition, that of Frankfort, 1620, likewise in 2 vols. folio, is generally used. There also remain of Ruault—'A Collection of Latin Poems,' Paris, 1610, 12mo.; 'Controversia de Duellis,' Paris, 1625, 8vo.; 'Preuves de l'Histoire du Royaume d'Yvetot,' Paris, 1631, 8vo.

RUBEFACIENTS are external agents which cause redness of the part to which they are applied. If long continued, they may, according to their nature, produce inflammation and some of its consequences. In such circumstances they are termed *Blisters* or *Escharotics*. It is however a degree of action short of what entitles them to these appellations to which this term is most frequently applied. Thus, friction with the hand or warm cloths often relieves spasmodic or neuralgic pains; and hot poultices or warm fomentations lessen inflammation of superficial or even deep-seated parts. Embrocations, when of a stimulating kind, act as rubefacients; and blisters, kept in contact with the surface for a short time only, cause redness of the part, and some remote secondary effects of a beneficial kind.

RUBENS, PETER PAUL, the most celebrated painter of the Flemish school, was born at Cologne, June 29, 1577. In his sixteenth year, after the death of his father, who was one of the échevins of Antwerp, Rubens was placed as a page in the household of the Countess of Lalaing in that city, but he soon returned home. At his own desire he became the pupil, first of Tobias Verhaegt, then of Adrian van Oort and Otho van Veen. In 1600, when Rubens was twenty-three years old, he proceeded to Venice, and thence to Mantua, where he accepted the place of gentleman of the chamber at the court of the Duke Vincenzio Gonzaga. In 1601 he went to Rome for a short time, and after returning to Mantua, visited Venice, and devoted himself to the study of the pictures of Titian and Paul Veronese. The Archduke Albert commissioned Rubens to paint three pictures for the church of Santa Croce in Gerusalemme at Rome, and in 1605 the Duke Vincenzio Gonzaga sent him on a special mission to Spain with a present for Philip III. That king received him most graciously, and after painting a large number of portraits of persons connected with the court of Madrid, he returned to Mantua. He paid a third visit to Rome, and in 1607 went through Milan to Genoa. In the latter city he executed many works, and a great number of his pictures still remain there. In 1609 Rubens married his first wife, Elizabeth Brant, and settled at Antwerp. The beautiful picture in the Munich gallery, representing himself and his wife seated in a garden, was probably painted shortly after his marriage. In 1620 he was commissioned to paint the series of pictures now in the Louvre which represent the principal events in the life of Maria de' Medici. He went to Paris, and received his instructions for these works, but the pictures themselves were executed at Antwerp, for the most part by the hands of his pupils. During his last residence at Paris, Rubens became acquainted with the Duke of Buckingham, who purchased his collection of statues and other works of art for 60,000 florins, or, according to De Piles, for 100,000. In 1626 Rubens lost his wife, and he shortly afterwards made a journey, in which he visited the principal Dutch painters of that time.

In 1627, when Charles I. declared war against France, Rubens, who was high in favour with the Infanta, widow of the Archduke Albert, was entrusted with some negociations with Gerbier, Charles's agent at the Hague. In the autumn of the same year he was dispatched to Madrid. During his stay in Spain he executed several very fine pictures, and gained the favour of Philip IV. and the Count-Duke of Olivarez. In 1629 Rubens was sent by the Infanta as ambassador to England. Whilst in England, he stood high in the favour of Charles I. The allegory of War and Peace now in the National Gallery, was painted as a present to the king, on the occasion of these negociations. The ceiling of Whitehall was sketched during Rubens's stay in England, but painted at Antwerp at a later period. For the latter work he is said to have received 3000*l*. In 1631 Rubens married his second wife, Helena Forman, a beautiful girl of sixteen. Her portrait often recurs in his pictures. He was again employed on a mission to Holland in 1633; and in December of that year, his patroness, the Infanta Isabella, died.

Rubens's fame now stood very high, and the commissions he received could only be executed by the aid of his numerous pupils. He expired in 1540, and was buried in the church of St. James at Antwerp.

Rubens's personal appearance was prepossessing, and his manner and conduct such as to make him generally beloved. Towards other artists he acted with the greatest generosity. His own character and merits as a painter have been the subject of much controversy, and will probably always furnish matter for discussion. In those parts of his art which act immediately on the senses, Rubens was without doubt a great master.

He understood the perfect management of light and shade, of composition, and of colour. If his merits are disputed, it is with reference to the subjects which he painted and to his mode of treating them, not to his technical skill.

The picture commonly referred to as the chef-d'œuvre of Rubens is the Descent from the Cross, in the cathedral at Antwerp. The best of his works are in the Munich gallery (principally derived from the Düsseldorf collection), at Antwerp, at Blenheim, and at Vienna. Many fine pictures by him are at Mechlin, Cologne, and in Spain. Vandyck was one of his pupils.

RU'BIA, a genus containing about forty species, found both in Europe and Asia. It belongs to the very large natural family of *Rubiaceæ*, to which it gives the name which itself derives from *ruber* (red), in allusion to the red colour yielded by many of the species. Amongst the numerous species several are employed in medicine and in the arts; in the latter for the sake of the colouring matter which is contained in the roots. *R. tinctorum*, Madder, has been long known, and was employed in medicine even in the time of Hippocrates, but is valued chiefly as a dye. It is a native of Europe and Asia Minor, but is now extensively cultivated in Holland and France; the culture has likewise been attempted, and successfully, in this country; but the English madder could not be sold so cheap as the foreign; it is therefore still largely imported, chiefly from Holland, France, Italy, Turkey, though cochineal, since it has become cheaper, is much used for the same purposes. It is employed by dyers and calico-printers as a red and scarlet dye. It has also the singular property of turning red the bones and secretions of fowls and other animals fed on it. *R. cordifolia*, the *Munjeet* of India, a native of Nepaul, &c., possesses similar properties, and is imported into England from Calcutta.

RU'BICON. [Cæsar, C. Julius.]

RUBLE. [Money.]

RUBRIC (from the Latin *rubrica*, a kind of red earth or stone), a name given to the titles of chapters in certain ancient law-books: and more especially to the rules and directions laid down in our Liturgy for regulating the order of the service. These, in both instances, were formerly written or printed, as the case might be, for distinction's sake in red characters, and have retained the name though now printed in black. In the Latin language *rubrica* is used in a similar manner. It signifies a heading or title of the things which are contained in a law or in an edict.

RUBRUQUIS, WILLIAM DE. This distinguished traveller was a friar of the Minorite or Franciscan order. Pits claims him as an Englishman, but it appears nearly certain that he was a native of Brabant. His real name was Ruysbrock, or Rysbruck, which he Latinised into Rubruquis. He was probably born about 1228. Soon after completing his noviciate and taking the major vows, he went to the Holy Land, with other monks and missionaries. The French king, Louis IX., who was in Palestine in 1253, sent a mission, consisting of Rubruquis, Friar Bartholomew of Cremona, and a friar named Andrew, in search of the great Tartar, Sartach, son of Baatu-Khan, who was supposed to be the great undiscoverable Christian potentate, Prester, or Priest-John. [Prester Joao.] Accordingly, the three, after spending a short time at Constantinople, took shipping and entered the Euxine or Black Sea. They were safely landed at Soldaia, now Soudac or Soujac, in the Crimea, May 21, 1253. But here their troubles began. They had brought no presents of any value, and presents are necessary passports all through the East, so that when, after a long journey of danger, fatigue, and privation, they, on Aug. 2, reached the encampment of Sartach, which was situated several days' journey east of the river Don, they were but ill-received. They also discovered that Sartach's Christianity was a dream. The Tartar chief however determined to send them on to his father Baatu, who was encamped on the banks of the Volga, not far from its confluence with the Caspian. Baatu told them that he could enter into no negociations, and that they must continue their journey until they came to Mantchu-Khan, the great Tartar emperor, who was to be found somewhere in the direction of China. At last, Dec. 27, the poor monks arrived at the camp and court of the Tartar emperor, and were lodged in a small dirty hovel. It is not possible to fix the spot where the erratic Mantchu-Khan was then residing. Rubruquis only tells us that it was in a vast plain, as flat as the surface of a lake; that before reaching the plain, he had crossed a lofty range of mountains, and had travelled due north. On Jan. 5, 1254, the friars were presented at court, where they had to perform several humiliating ceremonies. Mantchu-Khan gave them to understand that he was master of the whole world, and that the King of France and all the monarchs of christendom must submit to him. About the court were a good many Nestorian Christians; but their faith was sadly corrupted, and their priests were little better than conjurors and quacks.

On Whitsunday Rubruquis was called into the presence of the emperor, and told that he must return the way he had come. He took his departure a fortnight after Midsummer day. After a very remarkable journey, the dangers and fatigues of which were supported with admirable temper, Rubruquis reached Tripoli in Syria, in August, 1255. He had been, altogether, about two years and six months on his laborious travels, and he now besought his superior to allow him to go to King Louis at Paris. But the Franciscan provincial, being a strict disciplinarian, ordered the poor friar to write to Louis, and then retire to the convent of his order at Acre. The manuscript account of the travels was soon transmitted to Paris, and nothing more seems to be known about Rubruquis except that he was living as late as the year 1293. He was a man of rare good sense. The sobriety of his descriptions is marvellous for the time in which he lived. He was the first European traveller that gave a correct account of the Caspian Sea.

RUBUS (the Latin *rubus*, a bramble), a genus of plants belonging to the natural order *Rosaceæ*,

and to the section *Potentilleæ* of the sub-order *Rosaceæ* proper.

One hundred and forty-seven species of this genus are enumerated by Don, in Miller's 'Gardener's Dictionary,' which are divided according to the character of their leaves. The most remarkable of these is the *Rubus Idæus*, Common Raspberry, or Mount Ida Bramble, well known for its crimson edible fruit.

Rubus suberectus, Upright Bramble, is a British species, and grows on boggy heaths, by the sides of streams, &c., chiefly in mountainous districts of the North.

Rubus micranthus, Small-Flowered Bramble, is a native of Nepaul, and one of the most gigantic of the genus, attaining a height of eight or nine feet. The shoots sometimes attain a length of 20 feet. There are two other species, *R. distans* and *R. asper*, found with this in Nepaul, which have been grown in this country.

R. occidentalis, the Western Bramble, is a native of Canada and the West Indies, and was introduced into this country in 1696.

The Gray Bramble, or Dewberry (*Rubus cæsius*), is a native of Europe and the north-east of Asia, in woods and hedges. Many of the species described by botanists may be referred to this; the most important of these are *R. Sprengelii*, *R. dumetorum*, *R. foliolosus*, *R. flagellaris*, *R. coryliflorus*. The last, the Hazel-Leaved Bramble, is admitted as a species by most British botanists.

Rubus spectabilis, Showy Bramble, is one of the handsomest of the genus. It is an elegant shrub, growing to the height of four or five feet. It flowers in April and May, and has a large dark-yellow fruit, of an acid and astringent taste. It was brought from the banks of the Columbia River, in North America, by Mr. Douglas, in 1827, and is very deserving of cultivation.

Rubus fruticosus, Shrubby Bramble, or Common Blackberry, is one of the most common species of the genus. It is a native of almost all Europe, in hedges, thickets, and woods. There are not less than ten generally admitted varieties of this species, and some botanists make many more. The fruit of this species and its varieties are well known as Blackberries, or Bumblekites, and also Scald-Berries, from their supposed power of giving scald-head to children. Wherever they grow, they are picked by the children of the district on account of their sweet taste. *R. fruticosus* is a good plant for growing on loose dry ground for the purpose of fixing it previous to planting forest-trees. The shoots are used by thatchers for binding their straw, and also for making bee-hives. It is sometimes cultivated in order to produce a picturesque effect in gardening.

One of the most diminutive plants of the genus is the *R. arcticus*, the Arctic Bramble. It is a native of the mountainous and colder regions of Europe. Its stem never attains a greater height than six inches, and is furnished with from three to four leaves, with a single large deep rose-coloured flower, which is succeeded by a purplish red fruit highly prized for its flavour among the Swedes.

Rubus chamæmorus, the Cloudberry, grows in great abundance on the Scotch Highlands, and, under the name of Roebuck-Berries and Knot-Berries, the fruit is gathered in great quantities by the inhabitants of those districts. They have an agreeable flavour, and form a useful article of diet. This plant is one of the smallest of the genus, never growing more than eight or ten inches high.

RUBY. [Corundum.]

RUDBE'CKIA, a genus of plants dedicated by Linnæus to the memory of his predecessors, the Rudbecks, father and son, in the botanical chair at Upsal. It belongs to the natural order *Compositæ*, and possesses many species. Some of these are well known in gardens.

RUDDIMAN, THOMAS, was born in October, 1674, at Raggel, in the parish of Boyndie and county of Banff, Scotland. He was instructed in Latin in the parish school of Boyndie. At the age of sixteen he obtained, at King's College, Aberdeen, the first exhibition or bursary of the year, on account of his superior knowledge of Latin. After taking his degree of master of arts, he became schoolmaster of the parish of Lawrence-Kirk. He remained here three years and a half, when he was appointed assistant-keeper of the Advocates' Library at Edinburgh, but the allowance was so small that he was obliged, in 1707, to commence auctioneer. In 1709 he published Johnston's Latin 'Poetical Paraphrase of Solomon's Song' and Johnston's 'Cantica.' In 1713 his friend Dr. Pitcairne died, and Ruddiman, being still an auctioneer, managed the sale of his library, which was purchased by Peter the Great, emperor of Russia. In 1714 he published his 'Rudiments of the Latin Tongue,' a book which is well known, and is still used in most of the schools in Scotland. In 1715 he published an edition of Buchanan's works, in two volumes, folio, and in the same year he commenced printer, in partnership with a brother who had been brought up to the business; and some years afterwards he was appointed printer to the University of Edinburgh. He published, in 1725, the first part of his 'Grammaticæ Latinæ Institutiones,' which treats of etymology; and in 1732, the second part, which treats of syntax. After this time he was made principal keeper of the Advocates' Library. In 1751 he published an edition of Livy, in four vols. 12mo. About this time he resigned his post of keeper of the Advocates' Library, and was succeeded by David Hume. Ruddiman died at Edinburgh, January 19, 1757, in the eighty-third year of his age.

RUDING, ROGERS, born at Leicester, Aug. 9, 1751, was the second son of Rogers Ruding, Esq., of Westcotes. He was educated at Merton College, Oxford, of which he was some time Fellow, and by which he was presented, in 1793, to the vicarage of Malden and Chessington, in Surrey. He took the degrees of B.A., 1771; M.A., 1775; and B.D., 1782.

Ruding's attention appears to have been early directed to the defects of our monetary system, and in 1798 he published a pamphlet entitled 'A Proposal for Restoring the Ancient Constitution of the Mint, so far as relates to the Expense of Coinage; together with a Plan for the Improvement of Money, and for Increasing the

Difficulty of Counterfeiting.' In 1817 was published, in four quarto volumes, his 'Annals of the Coinage of Britain and its Dependencies, from the Earliest Period of Authentic History to the End of the Fiftieth Year of his present Majesty King George III.' The whole of the first edition was sold within six months, and was followed by another, in octavo, which brought down the history to the middle of the year 1818. This work is one of great value and interest. A new edition, extended to the commencement of the reign of Victoria, has been published by Mr. Hearne, in three volumes, quarto. Ruding died at Malden, Feb.16, 1820.

RUDOLSTADT. [SCHWARZBURG.]

RUE'LLIA, a genus of plants of the natural family of *Acanthaceæ*. The genus, as formerly constituted, embraced a great many Indian species, which are now distributed among some other genera. The genus is distributed through the tropical parts of Asia, including the tropical and subtropical parts of Australia. It includes many highly-ornamental plants, as are also those which have now been excluded from it. They are all easily cultivated, and often to be seen in our hothouses.

RUFFO, FABRI'ZIO, born about the middle of the 18th century, was the younger son of a noble Neapolitan family. He was brought up for the church, and being introduced at Rome to Pope Pius VI., he was appointed treasurer. He resigned his office on being made a cardinal, and returned to Naples, where King Ferdinand appointed him intendant of his palace and domain of Caserta. When King Ferdinand was driven away from Naples by the French republican army in 1798, Ruffo followed him to Sicily. The king appointed him to the command of the royalist population of Calabria; and in February, 1799, Ruffo crossed over in a boat with an escort of only five men and 3000 ducats, and landed at Bagnara, a fief of his family. The Calabrians flocked by thousands to Ruffo's standard; and the army of the 'Holy Faith,' which was the name it assumed, in less than a month was master of all Calabria. He was then joined by many regular officers and soldiers, and was supplied with artillery. The people in Apulia hoisted the royal flag; the Abruzzo was already in open revolt against the republicans of Naples, who were soon after abandoned by the French troops. Naples was left to its fate with only a small French garrison in one of the castles. Ruffo then advanced towards Naples by Avellino, and, after some fighting outside of the town, entered into a convention with the republicans, who were to be shipped off for France. The capitulation was signed by him, and a part of the republicans were actually sent off to France, when King Ferdinand arrived from Sicily and refused to sanction the capitulation. The minister Acton charged Ruffo with partiality for the Jacobins, as they were called, and the cardinal seized the opportunity of leaving Naples for the conclave, which had been summoned to assemble at Venice for the election of a pope. Ruffo followed the new pope, Pius VII., to Rome, where he was made Prefect of the Annona. Some years after he returned to Naples, where he resumed his place at the court. Ruffo died at Naples in 1827, at an advanced age.

RUFI'NUS, LICINIUS, a Roman jurist, who lived under Antoninus Caracalla (A.D. 211–217), whom he mentions once ('Dig.' 24, tit. i. s. 41). He was also consulted by Paulus ('Dig.' 40, tit. 13, s. 4). There are seventeen excerpts in the 'Digest' from a work of Rufinus entitled 'Regularia.'

RUFI'NUS, also called TORANUS, a priest of Aquileia, was born about the middle of the fourth century. He visited Egypt, and afterwards went to Palestine, where he encountered the opposition of the Arians, who banished him to the most desolate part of the country. He however returned to Jerusalem, where he built a monastery on Mount Olivet, and lived for many years. During his stay at Jerusalem he translated some of Origen's works, by which he offended his former friend St. Jerome, who attacked him in his 'Apology.' Their controversy excited a great stir at the time. The Western Church was generally opposed to Rufinus, and on his return to Aquileia he was cited before Anastasius, bishop of Rome, and, not appearing, his writings were condemned, and he was deprived of his rank as presbyter at Aquileia. He subsequently retired to Sicily, where he died about the year 410.

Rufinus translated into Latin the works of Josephus, the 'Ecclesiastical History' of Eusebius, several of Origen's works, the 'Orations' of St. Gregory Nazianzen, the ascetical rules of St. Basil, and other treatises of the Greek fathers. But these are all rather paraphrases than strict and literal versions. Rufinus wrote two books in reply to St. Jerome; an 'Apology' to Anastasius, bishop of Rome; an 'Explanation of Jacob's Blessing,' a 'Commentary upon Hosea, Joel, and Amos;' and an 'Explanation of the Apostle's Creed,' a work which is considered by modern theologians of considerable importance, as it contains a complete catalogue of the books of the Old and New Testament. The works of Rufinus were published by Sonnius, in 1 vol. folio, Paris, 1580.

RUFUS. [WILLIAM II.]

RUGBY. [WARWICKSHIRE.]

RUGELEY. [STAFFORDSHIRE.]

RÜGEN, an island in the Baltic, included in the Prussian province of Pomerania, has an area of 388 square miles, and a population of 35,000. It is separated from the continent by an arm of the sea at least a mile broad. It is deeply indented by the sea, and has the appearance of a number of peninsulas united by a small nucleus in the centre. On the east side is the peninsula of *Jasmund*, which is connected with the central part by a steep rocky ridge. The whole island abounds in romantic scenery. On the west it is level, but rises in the interior, and the northern coasts consist in general of rugged steep chalk cliffs. One of the most considerable eminences in the island is Mount Rugard, on which the residence of the princes formerly stood. On the north point of Jasmund is the Stubbenkammer, a lofty chalk cliff, which rises about 500 feet per-

pendicularly from the sea in the most irregular forms. Jasmund is connected by a narrow strip of alluvial soil with another peninsula called *Wittow*, a level tract with a rich soil, terminating in the promontory of *Arkona*, the most northern point of Germany. The island contains some antiquities, among which are several tumuli; and in a beech forest of Jasmund, a spot surrounded by a high wall, supposed to have been connected with the worship of the goddess Hertha. The soil of Rügen is in general fertile, and produces much corn. The number of cattle is considerable, and the fisheries productive. *Bergen*, the capital of the island, has about 3000 inhabitants.

RUGENDAS, GEORG PHILIPP, was born at Augsburg in 1666. He was the pupil of Isaias Fisches, an eminent historical painter. He visited Italy for the purpose of study; and at Rome he entered the famous Flemish Schilder-Bent, or Society of Painters, in which he was received, from his predilection for battle painting, under the nickname of Schild: all the members of this society were known only by nicknames.

In 1695, after an absence of five years, he returned to Augsburg, and had the opportunity of witnessing its siege in 1703. There is or was a large picture of the siege by him in the Stetten collection at Augsburg. Rugendas was made director of the Academy of Augsburg in 1710: he died at Augsburg in 1742. His design is vigorous and bold, but his colouring is unequal. He was the ancestor of a numerous family of painters and engravers, sons and grandsons. A Life of him by J. C. Füssli was published, together with a Life of Kupetzky, by the same writer, 'Leben Georg Philipp Rugendas und G. Johann Kupetzky,' Zürich, 1758.

Christian Rugendas, his second son, engraved about sixty of his father's designs in a very spirited manner, chiefly in mezzotinto. His own etchings, of which there are about thirty, are also much prized.

RU'HNKEN, DAVID, was born in 1723, at Stolpe in Pomerania. His parents, who were in good circumstances, sent the boy to the gymnasium of Königsberg, where he commenced his acquaintance with the classical writers. After finishing his studies at the gymnasium he went to the University of Wittenberg, where he studied ancient literature, history, and jurisprudence. He completed his studies at Leyden under Hemsterhuys, during which time he read most of the Greek authors with great care. But notwithstanding his severe application, he was fond of amusements: musical entertainments, the conversation of ladies, and hunting, were now, and remained during his whole life, his favourite recreations. During this time he continued his study of jurisprudence, and made preparations for an edition of Plato. In 1754 he published at Leyden an edition of Timæus, 'Lexicon Vocum Platonicarum,' with a commentary. In 1755 he was at Paris, where he examined the MSS. in the Royal Library. In the meantime his master and friend Hemsterhuys procured for him the appointment of lector (reader) in the University of Leyden. Ruhnken commenced his duties in October, 1757, and soon gained the reputation of being one of the most eminent scholars in Holland.

In 1761, on the death of Oudendorp, Ruhnken was appointed his successor as professor of eloquence and history. At the age of forty he married a handsome young woman, but in a few years she had the misfortune to lose, in consequence of an apoplectic stroke, first her speech and afterwards her sight, and in this deplorable state she survived her affectionate husband. In 1774 Ruhnken succeeded Gronovius as librarian to the university. The rest of his life was spent in the discharge of his duties and his literary labours. He died on the 14th of May, 1798, leaving two daughters. The city of Leyden purchased his valuable library, and gave his widow a pension of 500 florins.

Ruhnken was one of the most eminent critics of the 18th century. As a writer of Latin he has scarcely been surpassed by any modern scholar. He was very successful as a teacher; the most distinguished of his pupils was Daniel Wyttenbach, who wrote a life of his master.

A list of the various works of Ruhnken is given in the article 'Ruhnken,' in the 'Penny Cyclopædia.'

RUHRORT. [DÜSSELDORF.]

RUISCH, RACHEL, was born at Amsterdam in 1664; she was the daughter of Professor Ruisch, who had her taught flower-painting by Wilhelm Van Delst. In 1695 she was married to the portrait-painter Juriaen Pool. In 1701 she and her husband were elected members of the Society of Painters of the Hague, and in 1708 John William, elector of the Pfalz, appointed her his court painter. She died at Amsterdam in 1750, continuing to paint till she was upwards of eighty years old. Her works have been sold for very high prices.

RULE (in Law) is an order of one of the three superior courts of Common Law. Rules are either general or particular.

General rules are such orders relating to matters of practice as are promulgated by the court. They are a declaration of what the court will do, or require to be done, in all matters falling within the terms of the rule. The power of issuing rules for regulating the practice of each court is incident to the jurisdiction of the court. By the 3 & 4 Wm. IV. c. 42, the judges were authorised to make rules of a more comprehensive nature, relating especially to pleading in civil actions. These rules, after being laid before both houses of parliament within certain times mentioned in the act, were to have 'the like force and effect as if the provisions contained therein had been expressly enacted by parliament.' In exercise of this authority, a number of rules, generally called 'The New Rules,' have been promulgated, which have introduced very material changes in the mode of pleading.

Rules not general are confined to particular cases. Of these, some, which are said to be 'of course,' are drawn up by the proper officers on the authority of the mere signature of counsel; or in some instances, as upon a judge's fiat or allowance

by the master, &c., without any signature by counsel; others require to be handed in as well as signed by counsel. Rules which are not of course are grantable on application, or, as it is technically termed, 'the motion,' either of the party actually interested or of his counsel. Where the grounds of the motion are required to be particularised, the facts necessary to support it must be stated in an affidavit. After the motion is heard, the court either grants or refuses the rule. A rule, when granted, may, according to circumstances, be either 'to show cause,' or it may be 'absolute in the first instance.' The term 'rule to show cause,' also called a 'rule nisi,' means that unless the party against whom it has been obtained shows sufficient cause to the contrary, the rule, which is conditional, will become absolute. After a rule nisi has been obtained, it is drawn up in form by the proper officer, and served by the party who obtains it upon the party against whom it has been obtained, and notice is given him to appear in court on a certain day and show cause against it. He may do this either by showing that the facts disclosed do not justify the granting of the application, or he may contradict those facts by affidavits. The counsel who obtained the rule is then heard in reply. If the court think proper to grant the application, or if no one appears to oppose it, the rule is said to be made 'absolute.' If they refuse the application, the rule is said to be 'discharged.'

The rules which regulate the practice of the Court of Chancery are called Orders.

RULER, PARALLEL. In its usual form, this instrument consists of two rectangular rulers connected by two cross-bars of equal lengths, which move on pivots in the rulers in such manner that the four pivots, two in each ruler, shall be the four points of a parallelogram. One ruler being held fixed, and a line drawn with the edge of the other ruler in any position, then any motion given to the other ruler by the rotation of the cross-bars gives, on the edge of the moving ruler, a line parallel to the first line. To give the instrument more extent, three rulers are sometimes put together, each connected with the next by cross-bars in such manner that the cross-bars connecting the first and second have an opposite revolution to those connecting the second and third.

The rolling parallel ruler consists of an ordinary ruler of rectangular form, both edges of which are bevelled and divided into inches and tenths, or otherwise. Two short rollers of equal diameters, and connected by an axis of nearly the same length as the ruler, are let into perforations made in the latter, so that when the instrument is moved perpendicularly to its length on the paper, lines drawn along either of its bevelled sides are parallel to one another. Perpendiculars to a given line are drawn by adjusting the ruler so that any division on a bevelled edge may travel on the given line.

RUM, a spirit distilled from the sugar-cane, that is 'from cane-juice, or the scummings of the juice from the boiling-house, or from the treacle, or molasses, or from *dunder*, the lees of former distillations.' (Edwards's 'West Indies,' vol. ii., p. 279.) As the entire juice of the cane is not necessary for making rum, the distillation is carried on in conjunction with the manufacture of sugar. The best rum is made from the uncrystallised syrup called molasses. [MOLASSES.] The proportion of molasses made in crystallising a cwt. of sugar varies from 50 to 90 gallons, and depends both upon the climate and the season, being lowest in the Leeward Islands, which have a dry climate, and highest in Demerara and Trinidad, and it is in the latter that in fine seasons the proportion reaches 90 gallons per cwt. Nearly one gallon of proof rum may be made from one gallon of molasses.

RUMEX, the name of a genus of plants, from *rumex*, a sort of spike, spear, or halberd, which the shape of its leaves resembles. It belongs to the natural order *Polygonaceæ*. Most of the species of this genus are well known as troublesome weeds to the agriculturist, under the names of Docks and Sorrel. Some of them have been used in medicine, but their incomplete flowers and inelegant appearance have caused their almost entire neglect in the garden.

The species of Rumex that have been chiefly used in medicine are the *R. acetosa* and *hydrolapathum*. *R. acetosa*, Common Sorrel, is indigenous in this country, and it is also common in meadows and grassy pastures throughout Europe, from Lapland to Greece. It flowers early in June. *R. hydrolapathum*, Great Water-Dock, is found growing in marsh-land ditches, stagnant waters, and the margins of great rivers throughout Europe, as well as in North America from Pennsylvania to Virginia. It is by far the largest and most conspicuous of our indigenous docks, flowering from July to August.

RUMFORD, BENJAMIN, COUNT, was born at Woburn, New England, 1752. His family name was Thompson. When the revolution commenced he was a major of militia, and for his services to the king's cause obtained an appointment in the Foreign Office, London. During the contest he returned to New York and raised a regiment of dragoons. In 1784 he came to England, was knighted, and is said for some time to have acted as one of the under-secretaries of state. It was subsequently, while in the service of the King of Bavaria, that he prosecuted his most useful labours, for which several orders of knighthood were conferred upon him, and he was made a lieutenant-general and created a count. Towards the close of the century he once more came to England, and devoted his time to experiments on the nature and economical application of heat, and assisted in founding the Royal Institution. In 1802 he went to reside at Paris, and married the widow of Lavoisier, the chemist. He afterwards retired to Auteuil, a village near Paris, and devoted his time to rural pursuits and to chemistry and natural philosophy. He died in August, 1814.

The plans of Count Rumford for improving the arts and conveniences of domestic life have rendered his name well known in England. An account of these will be found in his 'Essays, Political, Economical, and Philosophical.'

RUM-ILI. [Turkey.]

RUMINANTS, *Ruminantia*, Cuvier's name for his eighth order of *Mammifères*, the *Pecora* of Linnæus.

Cuvier remarks that this is perhaps the most natural and the best defined of the class; for these animals have the air of being nearly all constructed on the same model; and the camels alone present some small exceptions to the common characters. [Camel; Llama.]

The first of these characters, observes the great French zoologist, is the possession of incisor teeth in the lower jaw only, and these are nearly always eight in number. They are replaced above by a callous rim (bourrelet). Between the incisors and the molars is a wide space, where are found, in one or two genera only, one or two canines. The molars, nearly always six in number on each side of the upper and lower jaws, have their crown marked with two double crescents, the convexity of which is turned inwards in the upper and outwards in the lower teeth.

The four feet are terminated by two toes and two hoofs, which oppose to each other a flattened surface, so that they have the appearance of a single hoof which has been split; whence these quadrupeds have obtained the name of animals with divided or bifurcate hoofs, &c.

Behind the hoof there are sometimes two small processes or spurs, the vestiges of the lateral fingers. The two bones of the metacarpus and the metatarsus are united into a single one, the canon bone, but in some species there are also vestiges of the lateral metatarsians and metacarpians.

The name *Ruminants* indicates the singular faculty possessed by these animals of masticating a second time their food, which they return into the mouth after a previous deglutition, a power which is the result of the structure of their stomachs, of which they have always four. Of these stomachs the first three are so disposed that the aliment can enter at the will of the animal into any one of the three, because the œsophagus terminates at the point of communication.

The first stomach or paunch (*rumen, penula, magnus venter, ingluvies; la panse* of the French) is much the largest in the adult animal, but not so in the recently born calf or lamb. It is divided outwardly into two bag-like appendages at its extremity, and it is slightly separated into four parts on the inside. The internal coat of this stomach is beset with innumerable flattened papillæ. Here are received the masses of herbage rudely broken up by the first mastication, and here it is (though they sometimes, but seldom, occur in the second) that the morbid concretions of a globular or elongated, but rounded, figure are generally found. These concretions are composed of three sorts of substances—of hairs, of the fibrous parts of plants, or of stony matter. The first of these are formed, particularly in the cow, by the animal's own hair, or that of another cow or ox licked off and gradually accumulated in the stomach. Sometimes these are hairy externally, but generally they are covered with a dark polished coat. The *Ægagropilæ* found in the Chamois consist of vegetable macerated fibres. The stony concretions have received the name of *Bezoar Stones*. [Bezoars.]

The herbage in the state above noticed is transmitted into the second stomach, honey-comb bag, bonnet, or king's-hood (*reticulum, ollula; bonnet* of the French), the walls of which are furnished with laminæ somewhat resembling the cells of bees: this, which is small and globular, may be considered as an appendage of the first stomach or paunch, but is distinguished from that by the elegantly-arranged polygonal and acute-angled cells, forming superficial cavities on its internal coat. Here the herbage is arrested, imbibed, and compressed into small masses or balls, which are thence returned successively into the mouth for remastication. During this operation the animals remain in a state of repose until all the herbage swallowed has undergone the action of the molar teeth a second time. The aliment thus remasticated is transmitted into the third or smallest stomach, the manyplies (*manyplus, echinus conclave, centipellio, omasus, psalterium; feuillet* of the French). This stomach is distinguished from the first two, both by its form, which has been fancied to resemble a hedgehog rolled up (whence the name *echinus*), and its internal structure, the longitudinal laminæ of its walls resembling in some degree the leaves of a book (whence the name *feuillet*). These numerous and broad duplicatures of its internal coat lie lengthwise, and vary in breadth in regular alternate order, amounting to about forty in the sheep, and about a hundred in the cow.

From the third stomach the food is transmitted into the fourth, the *red* (*abomasus, faliscus, ventriculus intestinalis; caillette* of the French), which is next in size to the first stomach or paunch, of an elongated pyriform shape, and with an internal villous coat similar to that of the human stomach, with large longitudinal wrinkles. This last is, so to speak, the true organ of digestion, analogous to the simple stomach of ordinary animals.

We will now proceed to inquire how this complicated machine is connected together and how it acts.

Blumenbach observes that the first three stomachs are connected with each other, and with a groove-like continuation of the œsophagus, in a very remarkable way. The latter tube enters just where the paunch and the second and third stomachs approach each other; it is then continued with the groove, which ends in the third stomach. This groove is therefore open to the first two stomachs, which lie to its right and left. But the thick prominent lips which form the margin of the groove admit of being drawn together so as to form a complete canal, which then constitutes a direct continuation of the œsophagus into the third stomach. The functions of this very singular part will vary according as we consider it in the state of a groove or of a closed canal. In the first case, the grass, &c., is passed, after a very slight degree of mastication, into the paunch as into a reservoir. Thence it goes in small portions into the second stomach, from which, after a further maceration, it is propelled, by a kind of antiperi-

staltic motion, into the œsophagus, and thus returns into the mouth. It is here ruminated and again swallowed, when the groove is shut, and the morsel of food, after this second mastication, is thereby conducted directly into the third stomach. During the short time which it probably stays in this situation, between the folds of the internal coat, it is still further prepared for digestion, which process is completed in the fourth or true digestive stomach. (Lawrence's 'Blumenbach.') In notes to the same work it is stated, that the shutting of the groove when the food is again swallowed after rumination supposes a power of voluntary motion in this part; and indeed, it is added, the influence of the will in the whole affair of rumination is incontestable.

Whilst the Ruminants remain at the teat and live upon nothing but milk, the fourth stomach is the largest of all. The first stomach or paunch only develops itself into its enormous volume in proportion as it receives supplies of herbage.

The intestinal canal of these animals is very long, but little enlarged or sacculated in the great intestines. The cæcum is moderately long and smooth.

We cannot here enter into an analysis of the various arrangements of the order *Ruminantia* proposed by different zoologists. We can only refer to Col. Hamilton Smith in Griffith's 'Cuvier;' to Mr. Swainson's 'Classification of Quadrupeds,' in Lardner's 'Cabinet Cyclopædia;' and to Mr. Ogilby's paper in 'Proceed. Zool. Soc.,' December, 1836. [PECORA; CAMEL; ANTELOPE; DEER; LLAMA; OX; GOAT; SHEEP; MACRAUCHENIA.]

Fossil Ruminants.

Ruminants, Oxen and Deer especially, occur in a fossil state in the tertiary series of strata, and most abundantly in the third and fourth divisions of the fresh-water deposits (Pliocene Period of Lyell). Bones of the Ox have indeed been found in the second or Miocene system of deposits, as at Georgensgemünd in Bavaria; but in the Pliocene Period the Ruminant remains are to be numerously traced, with extinct species of existing genera of *Pachydermata*, viz. Elephant, Rhinoceros, Hippopotamus, and Horse, together with the extinct genus Mastodon. The bone-caverns and the osseous breccia in the limestone fissures contain them plentifully; and they are widely spread over the face of the globe.

RUMOHR, CARL FRIEDRICH LUDWIG FELIX VON, was born near Dresden, in 1785. He was sent to the University of Göttingen, but at the age of 15 he discontinued his studies there, and placed himself with the painter J. D. Fiorillo. In 1804 he made his first tour in Italy. At Naples he commenced the formation of a collection of antiquities. He had already been collecting prints for some years. He returned to Germany in 1805. From 1805 to 1815 his time was passed chiefly in Bavaria and on his own estates in Holstein. His first publication appeared in 1811, and consisted of remarks on the plastic arts of the Greeks. This was followed by other essays on various departments of art, and among them a work entitled 'Sammlung für Kunst und Historie,' at Hamburg, in 1816, 2 vols. 8vo.

In 1815 he revisited Italy, and commenced in Florence the researches for his principal work, the 'Italienische Forschungen,' two volumes of which were published at Berlin in 1827, and the third in 1831. In 1828 he paid a third visit to Italy. Between 1828 and 1837 he published a variety of works, principally on art.

In 1837 he made a fourth journey into Italy, and published an account of his journey at Lübeck in 1838. He had previously published a work of the same kind on Tuscany. In 1841 however, after a fifth visit to Italy, to Venice, in the previous year, he returned to his more genial subject, and published in Leipzig an inquiry into the invention attributed to Finiguerra of printing with engraved plates on damped paper. This was his last labour in the history of art; and his last poetical production of this class was 'Raphaels Lehr-und-Wander-Jahre.' He died at Dresden of apoplexy, July 25, 1843.

RU'MPHIA, a genus of plants usually referred to the natural family of *Terebintaceæ* and to the sub-order *Burseræ*.

RUNCIMAN, ALEXANDER, was born at Edinburgh in 1736. His father, who was an architect, placed him, at the age of fourteen, in the studio of Norris the landscape painter. When only nineteen he set up as a landscape painter in Edinburgh, but with little success. In 1766 he visited Italy, and at Rome, where he stayed five years, formed his style upon that of Fuseli, who had a very high opinion of him. He returned to Edinburgh in 1771, and was appointed director of the new academy of the arts recently established there. Sir J. Clerk of Pennycuick employed him in the decoration of the hall of that place with twelve compositions from Macpherson's 'Ossian.' The picture of the Death of Agandecca is reckoned the best. While engaged in this work, Runciman painted also 'The Ascension' on the ceiling over the altar of the episcopal chapel in the Cowgate of Edinburgh. He painted also King Lear; Andromeda; Nausicaa and her Nymphs surprised at the Water Side by Ulysses; and Agrippina landing with the Ashes of Germanicus.

Runciman visited London in 1772 and exhibited some pictures there. He died suddenly before his own door in West Nicholson Street, Edinburgh, Oct. 21, 1785.

Runciman's best works are his sketches. There are a few etchings by him from his own designs: the best is considered 'Sigismunda weeping over the Heart of Tancred.'

RUNCORN. [CHESHIRE.]

RUNIC LETTERS is the name given to an ancient alphabet peculiar to the Teutonic nations, especially the Scandinavians and Germans. The alphabet consisted only of sixteen letters, most of which bear a great similarity to the Greek and Roman characters.

The earliest Runic characters are on stones which were either sepulchral monuments or landmarks. Such stones are found in Norway, Sweden, Denmark, Northern Germany, and in some parts of France and Spain; in short, in almost all countries where nations of the Teutonic race took

up their abodes during the fourth and fifth centuries of our æra.

RUNN. [HINDUSTAN, vii. 205.]

RUPERT, PRINCE ROBERT, was born Dec. 18, 1619. His mother, Elizabeth, eldest daughter of James I. of England, married Frederic V., elector palatine, who was banished and deprived of his estates in consequence of his unsuccessful attempt to seat himself upon the throne of Bohemia. Rupert, an exile from his youth, received little education. He had a taste for military pursuits, and offered his services to Charles I., who put him in command of a regiment of cavalry. He took Cirencester, Hereford, and Lichfield, and was engaged in the battles of Worcester, Edgehill, and Chalgrove Field; but he was remarkable rather for his rash courage and impetuosity than for prudence or military knowledge. He took Bristol, dispersed the parliamentary army at Newark, and was afterwards successful in the north; but at Marston Moor his indiscretion ruined the king's hopes: his want of concert with the Marquis of Newcastle and the hasty withdrawal of his troops from the field of battle are gravely censured by Lord Clarendon. The king's confidence in him however did not diminish; on the contrary, Rupert was soon after appointed general of all the king's forces. After the battle of Naseby, Rupert left the king at Hereford, and went hastily to Bristol that he might put that city in condition to resist an attack. The reverses that the king had sustained rendered his continuing in possession of Bristol a point of the most vital consequence. Rupert wrote so confidently of his operations that the king marched to Chepstow with the intention of joining him. He was dissuaded however; and, after a short defence, Rupert surrendered the city to the parliamentary army. For this pusillanimity the king deprived Rupert of his command. In 1648 however he obtained the command of that portion of the fleet which still adhered to the king; and immediately anchored in the harbour of Kinsale in order to assist the royalists in Ireland. Here Blake, with the parliamentary squadron, blockaded him, until (October, 1649) he forced his way out with the loss of two or three ships, and steered for Lisbon. He sailed to Carthagena, and thence to Malaga, where he captured and sunk some English merchantmen. Informed of this transaction, Blake, who had followed him from the coast of Ireland, attacked Rupert's squadron, and burnt and destroyed all but four or five ships, with which the prince escaped to the West Indies, where he captured some English and Spanish merchantmen. Prince Maurice, who accompanied his brother, was cast away, and Rupert contrived, with two or three ships, to return to France, where he sold them on behalf of Charles II. to the French government.

On the restoration of Charles II. Rupert left France and returned to England, where he was made a privy councillor, and received other honours. By this time the impetuosity of his youth had diminished, and when there was a commencement of hostilities with the Dutch, the appointment of Rupert to serve under the Duke of York was looked on without dissatisfaction. During the expedition he acquitted himself with credit, which was in no way diminished when, in the following year, he commanded the British fleet in conjunction with Lord Albemarle. In 1673 he was again nominated to the command of the fleet, but he found this squadron so ill equipped and weakly manned that he returned home. He was governor of Windsor Castle, and he there spent a great portion of his time, occupied for the most part with mechanical and chemical experiments, with painting and engraving. He died at his house in Spring Gardens, London, Nov. 29, 1682.

RUPICOLI'NÆ, a sub-family of Insessorial Birds allied to the *Manakins*, and generally arranged under the family *Pipridæ*. Mr. Swainson places both *Calyptomena* and *Rupicola* in the sub-family *Ampelinæ*, or *Typical Chatterers;* and *Rupicola*, in his arrangement, immediately precedes the sub-family *Piprinæ*, *Manakins*, which he considers as sub-typical. Mr. G. R. Gray ('Genera of Birds') places *Rupicola* and *Calyptomena* at the head of the *Ampelinæ*, the fourth sub-family of the *Ampelidæ* in his method.

Genus *Rupicola*, Brisson.—Examples:—

Rupicola aurantia (Cock of the Rock). This beautiful bird inhabits Guiana, especially about the rocks which border the small river Oyapock, and is becoming daily more rare.

Habits, &c.—The Cock of the Rock flies swiftly, and is a very shy bird. The nest is made of twigs and dry herbage; and there the female lays two white eggs about the size of those of a pigeon. The food consists of the smaller wild fruits.

Cock of the Rock (*Rupicola aurantia*).

Rupicola Peruviana.—The Peruvian Cock of the Rock was for some time considered to be a mere variety of *Rupicola aurantia*, but it differs in being of larger size, in colour, in the length of the tail-feathers, in the absence of the filiform wing-feathers, and in the crest, which is not circular as in the preceding species.

Locality.—Supposed to be the interior of Peru and Mexico: it has been brought to Europe from Lima.

Genus *Calyptomena*, Raffles. Example.—*Calyptomena viridis*. Inhabits Singapore and the interior of Sumatra. Sir Stamford Raffles states that this species is found in the retired parts of forests, and as it is of the colour of the leaves, and perches high, it is not easily procured. He further tells us that the stomach contained nothing but vegetable substances, chiefly wild grains.

RUPPE'LLIA, the name given by M. Milne Edwards to a genus of Cancerians (*Canceriens Arqués*) established on the *Cancer tenax* of the German zoologist and traveller Rüppell, and considered by M. Edwards as the type of the small group which leads to the genera *Ozius* and *Eriphia*.

Example.—*Ruppellia tenax* (*Cancer tenax*, Rüppell.). *Locality.*—The Red Sea.

RU'PPIA, a genus of plants belonging to the natural order *Alismaceæ*. There is only one species belonging to this remarkable genus, and that is a native of Great Britain. *Ruppia maritima*, Sea Ruppia, is found in salt-water pools and ditches.

RUPPIN, NEW. [Brandenburg.]

RUPTURE. [Hernia.]

RUREMONDE. [Limburg.]

RUSCUS, the name of a genus of plants belonging to the natural order *Smilaceæ*, known by the common name of Butcher's Broom. The species of this genus are evergreen, and on this account are frequently introduced for undergrowth in shrubberies. One of the species, *Ruscus aculeatus*, Common Butcher's Broom, is found wild in Britain.

RUSH, the common name of the species of *Juncus*, a genus of plants belonging to the natural order *Juncaceæ*. The species are numerous, and are found mostly in moist boggy situations, in the colder parts of the world: several are however inhabitants of tropical regions. The *Juncus effusus*, the Soft Rush, and the *Juncus conglomeratus*, the Common Rush, are used in many parts of the country for plaiting into mats and chair-bottoms, and for constructing small toy-baskets. The wicks also of the candles known as rush-candles are made from the pith, or more properly speaking the soft inner portion of the stem, of the same species, which is chiefly composed of cellular tissue.

RUSH. [Dublin, County.]

RUSH, BENJAMIN, was born near Philadelphia, in December, 1745. At the age of fourteen he was sent to the College of Princeton, where at fifteen he obtained the degree of bachelor of arts, and commenced his medical education with Dr. Redman, then an eminent practitioner in Philadelphia. At the age of twenty-one he repaired to Europe, and studied two years at Edinburgh. After passing some time in London in attendance at the hospitals and lectures, and paying a visit to Paris, Dr. Rush returned to Philadelphia in the spring of 1769, and commenced the practice of physic. In the Congress of 1776 he was a representative of the state of Pennsylvania; and subscribed the declaration of independence. He was appointed physician-general of the military hospital of the middle department in 1777; and chosen a member of the state convention for the adoption of the federal constitution ten years afterwards. In 1789 he succeeded Dr. Morgan in the chair of the theory and practice of physic. The College of Philadelphia and the University of Pennsylvania becoming united in 1791, he was appointed professor of the institutes of medicine and clinical practice; and from the year 1805 to the end of his life he held the united chairs of the theory and practice of medicine and of clinical practice. On different occasions he received medals from the King of Prussia and the Queen of Etruria, for information communicated to them in answer to inquiries concerning the yellow-fever; and in 1811 the Emperor of Russia sent him a diamond ring as a testimony of respect for his medical character. His useful life was terminated, after a short illness, April 19, 1813.

The number of Dr. Rush's works is considerable. They include a history of the yellow-fever as it appeared in Philadelphia in 1793, and of other epidemics of different years. One of his latest works was a 'Treatise upon the Diseases of the Mind.' In 1787 he published an 'Inquiry into the Effects of Public Punishments upon Criminals and upon Society,' to which the mitigation of the Pennsylvanian code is attributed. He also edited the works of Sydenham, Cleghorn, Pringle, and Hillary. The principal papers published at various times by Dr. Rush are collected and comprised in two volumes of 'Medical Inquiries and Observations.'

RUSH-BEARING, another name in some parts of England for the country wake. In ancient times the parishioners brought rushes at the anniversary of the dedication of the church, with which to strew it, and thence the festivity itself obtained the name of Rush-bearing.

RUSHWORTH, JOHN, is said by Anthony Wood to have been born in Northumberland about 1607, and to have studied for a short time at Oxford. Coming up to London, he entered himself of Lincoln's Inn, and was called to the bar; but it does not appear that he ever practised. When the Long Parliament met, in November, 1640, Rushworth was appointed assistant to Henry Elsynge, Esq., clerk to the House of Commons; and was thus enabled to make ample collections relating to all the most interesting public transactions of the time. It appears to have been his practice to take down in a species of short-hand whatever was said in the house which he thought worth preserving. He tells us himself that, on the evening of the day on which the king made his attempt to seize the five members, he furnished the king with a report of his own speech, which appeared in print next morning by the king's order. But besides his services as clerk and reporter, after the king had left London, Rushworth was the person usually employed to carry addresses and other communications from the house to his majesty.

In 1643 he took the covenant with most of his party. In 1645, when the command of the parliamentary forces was given to Sir Thomas Fairfax, who was his near relation, Rushworth was appointed his secretary. Being at Oxford in Fairfax's

suite in 1649, he received from the university the degree of M.A. Having returned to London, he was, in 1652, appointed one of the committee for the reform of the common law. The next time we hear of him is as one of the members for Berwick in Cromwell's last parliament, which met in January, 1658; and he again sat for the same borough in that which restored Charles II., in April, 1660. When Sir Orlando Bridgeman was made lord keeper in 1677, he appointed Rushworth his secretary; and we find him sitting again for Berwick, both in the parliament which met in March, 1679, and also in that which met at Oxford in 1681. But after this, it is stated, he lived in retirement and obscurity, till, in 1684, he was arrested for debt and sent to the King's Bench prison, where he remained till he died, May 12, 1690.

The first part, in one volume folio, of Rushworth's 'Historical Collections of Private Passages of State, Weighty Matters in Law, and Remarkable Proceedings in Parliament,' embraces the space from 1618 to 1629, and was first published in 1659. Part second, in two volumes, extending from 1629 to 1640, appeared in 1680; and that same year Rushworth also published, in one volume folio, his account of the Trial of the Earl of Strafford, which is now considered as forming the eighth volume of his 'Historical Collections.' The remaining parts of that work were left ready for the press at his death, and were published at intervals. All the seven volumes, together with Strafford's Trial, were reprinted in 1721.

RUSSELL, LORD WILLIAM, was born in September, 1639. He was the son of William Russell, fourth Earl of Bedford, who married Lady Anne Carr, daughter of the Countess of Somerset, known for her participation in Sir Thomas Overbury's murder. He was educated at Cambridge, afterwards resided at Augsburg, spent a considerable time in different parts of the Continent, returned to England at the Restoration, and was elected member for Tavistock. He associated himself with the popular party, which before long gained so great an influence in the country that the king prorogued the parliament, and when it re-assembled found that it was hopeless to attempt the continuance of the Dutch war. Thus the alliance with France was dissolved, and the troops by which Charles had wished to make himself absolute were dispersed; the Cabal ministry was broken up, and Buckingham and Shaftesbury were converted into popular leaders. The king's subsequent intrigues with France were further opposed by Russell; the country party recommended war with France, promoted the impeachment of the king's minister and favourite, Lord Danby, and voted the exclusion of the Duke of York from the succession to the throne. Some of the principal Whigs were accused of having conspired to take the king's life, to raise a rebellion in the country, and to establish the Duke of Monmouth, the king's illegitimate son, upon the throne. This was called the 'Rye-House Plot,' from the name of a farm near Ware, at which it was said that the conspirators agreed to meet, in order to attack and dispose of the king as he returned from Newmarket races. Russell, Essex, Sidney, and a number of less important persons, were immediately committed to the Tower. Some were convicted and executed before Russell was brought to the bar. On July 13, 1683, he took his trial at the Old Bailey for high treason. A full account of the proceedings is given by Lord John Russell ('Life of Lord Russell,' p. 184), and in Phillips's 'State Trials.' An illegal construction was put on the 25th of Edward III., the statute under which he was indicted. The evidence against him was contradictory and insufficient; no one charge in the indictment was proved: but in the nomination of the panel, the sheriffs, who were creatures of the court, had secured his conviction. He was found guilty, sentenced to death, and beheaded in Lincoln's Inn Fields, July 21. The firm and noble conduct of Lady Russell (the second daughter of the Earl of Southampton), who attended her husband during his trial, to take notes and give him assistance, deserves the greatest admiration. She died at Southampton House, in Sept., 1723, at the advanced age of eighty-six.

Lord Russell as a politician was zealous and energetic, though not conspicuous for ability, the high public estimation in which he was held being founded upon his sense, his judgment, and his integrity. An act for annulling his attainder, which passed in the first year of William and Mary, recites that 'he was, by undue and illegal return of jurors, having been refused his lawful challenge to the said jurors for want of freehold, and, by partial and unjust constructions of law, wrongfully convicted, attainted, and executed for high treason.'

RUSSELL, ALEXANDER, a native of Edinburgh, having finished his studies in the university of that city, came to London, and in 1740 was appointed physician to the English factory at Aleppo. On his return to England, in 1754, he published his 'Natural History of Aleppo,' a valuable and interesting work. Four years after the publication of this work, he was elected physician to St. Thomas's Hospital in Southwark, which office he retained till his death in 1768. He was a man of great abilities, industry, and humanity. He presented several contributions to the Royal and Medical Societies. A second edition of his 'Natural History of Aleppo,' has been translated into several European languages.

RUSSELL, PATRICK, brother of Dr. Alexander Russell, was born in Scotland, in 1726. He completed his medical studies in the University of Edinburgh, and some time afterwards we find him at Aleppo, residing with his brother Dr. A. Russell, on whose return to England, Dr. Patrick Russell succeeded him as physician to the British factory at Aleppo. It was during his residence in this capital that the great plague of 1760 and the two following years broke out in Syria, and gave him opportunities of studying this disease in all its varieties. His quarto work on the plague, which was published some years after his return to England, is justly esteemed one of the best and most complete that ever has been written on the subject. In 1796 he pub-

lished an account of the Indian serpents collected on the coast of Coromandel, containing descriptions and drawings of each species, together with experiments and remarks on their several poisons. He died in 1805, and his name will be found among the contributors to the 'Transactions of the Royal Society.'

RUSSELL, WILLIAM, LL.D., the son of poor parents, was born in the county of Selkirk in 1741, and educated very imperfectly. He served an apprenticeship as a printer, and while working as a journeyman in Edinburgh, edited a collection of modern poetry, and translated a tragedy of Crebillon, which was submitted to Garrick, but rejected. In 1767 he went to London, and while employed as corrector of the press for Strachan the printer, he contributed to periodical works, and published several poetical and other volumes, among which was a History of America. In 1779 appeared the first two volumes of the popular compilation by which he is now known, 'The History of Modern Europe.' The third, fourth, and fifth volumes, bringing down the narrative to 1763, were published in 1784. In 1787 he married, and took up his residence on a farm in Dumfriesshire, where he spent the remainder of his life. In 1793 he published the first two volumes of a 'History of Ancient Europe;' and he had also begun, in terms of an engagement with Mr. Cadell, to compose a History of England from the Accession of George III., when he died, Dec. 25, 1793.

RUSSIA. *The Russian Empire* extends over the north-eastern part of Europe, over the whole of Northern Asia, and the north-western coast of North America. It consists of *Russia in Europe;* GEORGIA, SIBERIA, and KAMTCHATKA, in Asia; and some settlements on the north-west coast of North America. [NORTH-WEST TERRITORY.] The area and population have been estimated as follows:—

	Sq. Miles.	Population.
Russia in Europe . .	1,700,000	56,000,000
Russia in Asia . . .	4,400,000	4,000,000
Russia in America . .	400,000	500,000
	5,500,000	60,500,000

The following List exhibits the great portions, governments, and districts of the Russian Empire:—

RUSSIA IN EUROPE.

Baltic Provinces.—St. Petersburg, Finland, Esthonia, Livonia, Courland.

Great Russia.—Moscow, Smolensk, Pskow, Twer, Novgorod, Olonetz, Archangel, Vologda, Yaroslaw, Costroma, Vladimir, Nischnei Novgorod, Tambow, Riasan, Tula, Kaluga, Orel, Kursk, Voronetz.

Little Russia.—Kiev, Czernigov, Poltava, Slobode-Ukraine.

South Russia.—Ekaterinoslav, Cherson, Taurida, Bessarabia, Don Cossacks, Georgia (including Daghestan, &c.), Saratow.

Western Russia.—Wilna, Grodno, Vitepsk, Mohilev, Minsk, Volhynia, Podolia, Bialystok.

Poland.—Cracow, Sandomir, Kalisch, Lublin, Plock, Masovia, Podlachia, Augustovo.

RUSSIA IN ASIA.

Astrakhan. Casan. Pensa. Simbirsk. Wiatka. Siberia.—Tobolsk, Omsk, Tomsk, Yenisseisk, Irkutsk, Yakutzk, Ochotzk, Kamtchatka.

RUSSIA IN AMERICA.

North-West Territory.

ISLANDS IN THE PACIFIC.

Aleutian Islands, Kurile Islands, &c.

Russia in Europe extends from 43° to 71° N. lat., and from 20° to 63° E. long. It is divided from Asia by the Ural Mountains, and by the river Ural until it falls into the Caspian Sea. From the mouth of the river Ural the boundary runs along the north-western shore of the Caspian Sea to the embouchure of the river Kooma. At this point begins the southern boundary-line, which follows the rivers Kooma, Manytch, and Ieia, the Sea of Azof, the Straits of Yenikalé, and the Black Sea. Near its western boundary Russia extends to the banks of the Danube, which forms the boundary between it and Turkey as far as the mouth of the river Pruth (near 28° E. long.). The Pruth divides Russia and Turkey nearly to its source in the Carpathian Mountains. Russia then begins to border on the kingdom of Galicia, and afterwards on Poland and Prussia. Farther north it comes up to the Baltic, surrounding the Gulfs of Riga and Finland, and stretching along that of Bothnia to its northern extremity (66° N. lat.). It is separated from Sweden by the lower course of the river Tornea, and farther north by its affluent the Muonio. The boundary between Russia and Norway is partly formed by the watershed between the Gulf of Bothnia, and partly by the course of the river Tana. A small part of Norway extends east of the river Tana. On the north, Russia is washed by the Arctic Ocean, which here forms the extensive gulf called the White Sea.

Surface.—The whole surface of Russia may with propriety be considered one extensive plain. If the Ural Mountains, which extend along its eastern border, and a mountain tract in the peninsula of the Crimea [CRIMEA] are excepted, there is not in this immense extent of country an eminence which rises more than 500 feet above its base, or more than 1100 feet above the sea-level. The watershed which divides the rivers that flow to the Arctic Ocean, the Baltic, the Black Sea, and the Caspian Sea, is not formed, as in Western Europe, by mountains, but by tracts of gently-rising ground.

Taking the town of Mojaisk on the Moskwa as a centre, there are three lines of watershed, extending to the limits of European Russia in three directions. The first watershed extends westward to the banks of the river Bug, about 52° N. lat., 24° E. long.; its most elevated point is about 700 feet; it forms an almost continuous swamp, in which many affluents of the Vistula, Dnieper, and Niemen take their rise; and it divides the rivers which flow into the Baltic from those which flow into the Black Sea. The second watershed begins near the Moskwa, and extends in a general N.E. direction to the Ural Mountains, which it reaches in 61° N. lat., 59° E. long.; its most elevated point is 934 feet; it contains more forest

and less morass than the first watershed; it contains the sources of the Volga, and other large rivers; and divides the rivers which flow into the White Sea from those which flow into the Caspian. The third watershed begins near the same point, and extends S.E. to the Ural in 56° E. long.; 't has more sandy hills than either of the other two. This basin divides the Volga from the rivers which run southward and unite with the Dnieper and the Don.

Besides these lines of watershed, there is in the southern provinces an elevated tract, the base of which is granite, and which traverses it nearly from east to west, but does not form a watershed, being broken through by several large rivers. At its western extremity it is connected with the eastern offsets of the Carpathian Mountains, and at its eastern it fills up the great bend of the river Don which occurs between 48° and 50° N. lat.

Soil.—Russia has a much greater variety of soil than any other country of Europe. Some very extensive tracts are hardly more adapted for agriculture than the great African desert; while others in fertility may be compared with those countries without the tropics which are most favoured by nature. In taking this survey of Russia, we begin from the north-east.

Between the northern portion of the Ural Mountains on the east and the river Mezen on the west, is the region of the *tundras*, which extend from the coast to 64° N. lat. Climate and soil render this region unfit for cultivation. To the south and west of the *tundras* extends the largest forest in Europe, said to cover 150,000 square miles. The winter is long and severe, and the cultivation scanty. This region extends westward to the river Onega, and southward to the *uwalli*, the northern declivity of which, chiefly occupied by swamps, but well wooded, belongs to it. West of the river Onega begins the region of rocks and lakes. It extends over the Isthmus of Finland. It has a much more broken surface than any other portion of Russia of equal extent. It is supposed that one-fourth of the surface is covered with water. The general surface of the country appears to be lowest towards the east, north of the lake of Ladoga, where it probably does not attain 200 feet above the sea-level, whereas some of the lakes have an elevation of 700 feet. The rocky elevations which divide the lakes from one another occupy only a small space. All the northern shores of the Gulf of Finland, and the eastern shore of the Gulf of Bothnia, as far north as 64° N. lat., are high and rocky, especially the former. Pine-forests still cover more than nine-tenths of the country, perhaps not less than 30,000 square miles. There are few cattle in these districts, owing to the want of meadows, and the difficulty of maintaining them through a winter which lasts eight or nine months. Both agriculture and pasturage are better in the western than the eastern portion of this region. The timber cannot be brought to market on account of the cataracts which occur in all the rivers; but a great quantity of tar is annually made in the forests. The surface of Russian Lapland is mostly a level, on which some sand-hills rise a few hundred feet above their base. There are numerous depressions on this plain, but most of them are of little depth, and form only extensive bogs; the deeper depressions are permanent lakes, of which some, as that of Enara, are of great extent. The soil affords pasturage for reindeer and cattle. In the southern districts there are considerable forests of high growth; but towards the north they are less frequent, and the trees are of diminutive size. A few tracts more fertile are met with. On the southern coast of the Gulf of Finland, the shores are composed of limestone, and rise abruptly from the sea like a wall to an elevation of 60 to 180 feet. From this elevated coast, the country extends in a level plain from 30 to 40 miles southward, and then descends to the plain of Livonia by a gradual slope. The surface of the plain is covered with a layer of mould of moderate fertility. The country that surrounds the innermost recess of the Gulf of Finland on both sides of the river Neva, forms a depression which extends round the southern shores of the lake of Ladoga, and continues to the southern extremity of that of Onega. Towards the south it reaches, near 59° N. lat., the hilly tracts that branch off from the table-land of Valdai. A moderately-thin layer of mould covers a subsoil of rock; but only a small portion of this region is cultivated.

The table-land of Valdai and the elevated tract which extends from the river Msta to the lake Bielo Osero were formerly covered with extensive forests, but the greater part of them have been cleared away. The undulating surface of this region produces tolerable crops. A sandy and sterile ridge separates the elevated table-land of Vitepsk and Pskow from the low plains of Livonia, which extend westward from it to the shores of the Gulf of Riga. In this tract the soil is chiefly loamy, and has a considerable degree of fertility. To the west of 26° E. long., the country is nearly level, but it is less fertile. The immense tract of country which extends south from the Düna is traversed from north to south by a series of table-lands, which occupy extensive tracts between the Düna and Vilia (an affluent of the Niemen), the Vilia and the Niemen, and the last-mentioned rivers and the Bug, and extend eastward to the swamps. The more elevated portions of these table-lands are from 400 to 800 feet above the sea-level, and as the soil is sandy and dry, but well penetrated by the water from the melting of the snow, they are covered with pine forests, which supply the best pine timber in Europe. The lower countries along the banks of the rivers have a tolerably fertile soil.

The basin of the river Volga occupies 650,000 square miles, and constitutes the most important, and, generally speaking, the most fertile portion of the whole empire. [VOLGA.] The plains along the banks of the Volga above and below Twer are moderately fertile; but farther down the land is less fertile, and the climate more severe and less favourable to the growth of grain, so that hemp and flax are the principal objects of agriculture. In the southern portion of the basin of the Volga, the soil improves as we proceed both south and

east from the river. In the government of Moscow it is fertile, but still more so in those of Kaluga and Tula, and a part of Orel. But on approaching the watershed in Orel, the soil, though clayey, is very dry, and partakes of the nature of the steppes which lie towards the Black Sea. The middle basin of the Volga extends from the mouth of the Oka downwards to the ridge of Samara. It contains the most fertile part of the basin of the Volga, and perhaps of all Russia. Pallas repeatedly asserts that this region is the granary of the empire. To the north and east of this portion of the basin of the Volga extends that of its largest affluent, the Kama, which flows from a hilly country near the Ural Mountains. The higher portions of the country are entirely covered with forests. A great part of the lower country is also wooded, but extensive tracts have been appropriated to the cultivation of rye, barley, and oats. The lower course of the Volga traverses an immense steppe or desert, which not only extends over the whole of the lower basin of the river, but stretches out eastward to the banks of the river Ural, along the course of which it extends from its mouth to the place where it issues from the valleys of the Ural Mountains. The bed of the river Volga is from 40 to 60 feet below the level of the steppe. The river flows from the bend at Sarepta (48° 30′ N. lat.) in a valley from 20 to 30 miles wide, the surface of which is not much above the common level of the river. It consists of alluvial soil, and the river has accordingly formed in it numerous channels, which frequently unite and separate again.

Near the western extremity of a ridge called the Obstshei Sirt begins the Naryn, an elevated tract of sand, which runs from thence nearly to the Caspian Sea. Its length is above 300 miles, and it varies in width from 30 to 100 miles. The surface is covered with hills varying from 12 to 30 feet in height; they lie generally in groups close together, but sometimes the groups are separated from one another by large level tracts. The hills consist of fine white sand intermixed with broken shells and decomposed lime, and are quite destitute of vegetation; but it is remarkable that a few feet below the surface spring-water is always found among these hills, and in some of the depressions many rare plants grow. On the west of the Naryn a great depression occurs, which contains numerous salt lakes and hills of rock-salt, whence large quantities of salt are obtained. The portion of the steppe which lies eastward of the Naryn is also impregnated with salt.

As no mountains intervene between this steppe and the western countries of Europe, the climate of this region, which is intensely cold in winter, and no less intensely hot in summer, produces effects which are felt as far west as Great Britain, the temperature of which is affected by the prevalence of wind from the direction of these steppes.

That portion of southern Russia which lies west of the lower basin of the river Volga extends along the coast of the Black Sea, as far west as the Danube and Pruth. The peninsula of the Crimea, of which the mountainous part is very fertile, contains a salt-steppe and other barren

tracts, but there are a few districts which are mostly covered with grass, and supply tolerable pasture. North of this country there is a steppe of somewhat different character. It comprehends the whole country south of the granite tract which traverses Russia from east to west. Want of wood and of water are its characteristic features. It is considerably more elevated than the low steppes near the Caspian Sea, and is not impregnated with salt, except between the mouths of the rivers Dniester and Danube. Within the granitic tract the surface of the country is more broken, especially west of the Dnieper, and in these parts the narrow valleys between the low hills are chiefly covered with bushes, and contain many tracts fit for agricultural purposes.

The country north of this extensive steppe may be divided into two regions. The western lies on both sides of the middle course of the river Dnieper. On the west of the river it extends from the northern border of the steppe to the great swamps of Pinsk and Ratnor. On the east of the Dnieper it comprehends the country of the Ukraine. The surface of this region is chiefly undulating, but in many places it extends in level plains. The soil mostly consists of a fertile black mould. The eastern portion of the region lies within the basin of the river Don; it appears to be more elevated than the western region, and partakes more of the nature of the steppe, as wood and water in many parts are scarce.

In conclusion, if we view Russia as an agricultural country, it appears that the most fertile region traverses nearly the central part of it, extending from between 48° 30′ and 52° on the west, north-eastward to between 53° and 56° N. lat. on the east. It lies between 25° and 50° E. long. The central part of this region, that about Moscow and in the basin of the river Oka, is the least fertile, but the most eastern and western parts may be enumerated among the most productive countries in Europe. On both sides of this central region the fertility decreases, but less rapidly towards the north than towards the south.

Rivers and Lakes.—The principal rivers are noticed in the articles Dwina, Volga, Düna, Niemen, Dnieper, Dniester, Danube, Don, and Ural. As Russia is a level country, the rivers present a greater line of inland navigation than those of most other countries. The Volga, Niemen, and Dwina, have fewest interruptions to continuous navigation: the others being much obstructed by shallows, rapids, and falls.

Lakes are very numerous in certain parts of the empire, especially in the north-west and south-east. Almost all the lakes which occur in the salt steppes that surround the northern shore of the Caspian, as well as in those of the Crimea and the Nogay steppe, are salt lakes, and salt might be obtained from all of them. The lakes from which salt is actually obtained are the lakes of Elton, Bogdoin-Dabossu, and Inderskoe. There are very few lakes in the interior of Russia, and they are all small; but those of the countries surrounding the Gulf of Finland are very numerous. The largest is the lake of Peipus or Pskow, which is nearly 90

miles long, in its northern part nearly 30 miles wide, and in some parts 10 fathoms deep. In the country north of the Gulf of Finland there are several systems of lakes, of which the chief are Saima Lakes and Païana Lakes. The country which extends between the innermost recess of the Gulf of Finland, and that bay of the White Sea which is called the Gulf of Onega, contains the largest lakes in Russia and in all Europe, the Ladoga and the Onega. Lake Ladoga is nearly 120 miles long, and its greatest width is 70 miles. A few rocky islands occur along its north-western shores, but none in the main body of the lake. The depth in some places is nearly 150 fathoms. The Lake of Onega is more than 120 miles long, with an average width of nearly 40 miles. Along the shores there are numerous rocky islands, but the main body of the lake is free from them. The waters of this lake are discharged into that of Ladoga by the Swir River, which is about 120 miles long, and flows through a low and swampy country overgrown with thick forests. The surplus of the waters collected in the Lake of Ladoga is carried to the Gulf of Finland by the Neva, past St. Petersburg.

Three of the smaller lakes require mention on account of the facility that they have afforded for establishing a water-communication by canals in the interior of Russia. The lake called Bieloë Ozero, or White Lake, lies between 60° and 60° 20′ N. lat. and between 37° and 38° E. long. The Kobenskoë Lake lies about 40 miles from the Bieloë; and the third lake the Ilmen lies between 58° and 58° 30′ N. lat., and near 31° E. long.

As the hydrography of Russia affords many facilities for the formation of canals, Peter the Great planned many such works, and his successors have formed others. All the canals which have been undertaken to unite rivers having their rise south of 55° N. lat. have failed on account chiefly of deficiency of water; but those which have their sources farther north are found better fitted for this purpose. The three most important constitute a water-communication between the river Volga and the lakes of Onega and Ladoga, and consequently with the Neva and St. Petersburg. The most famous and most frequented of them is the canal of Vishnei Volotshok, only three miles long, by which a direct water communication is opened between St. Petersburg and Astrakhan, a distance of 3200 miles, this great length of navigation being carried on by means of the river Twerza, Lake Mstino, the river Msta, Lake Ilmen, with a few miles of subsidiary canal, and the Volchow. The second line of water-communication is formed by the Tikhwina Canal, which is farther to the north-north-east, near 59° 25′ N. lat. and 34° 20′ E. long. This line of inland navigation begins in the Volga at the mouth of the river Maloga, and is the means of uniting the Volga with Lake Ladoga. The canal itself is only 5 miles long, and 36 feet wide at its upper level; but the number of locks amounts to eighty-six, which occur in a space of about 120 miles. The third line of water-communication traverses the two lakes of Onega and Bieloë Ozero, and extends to St. Petersburg.

As these three systems of inland navigation traverse the lakes of Ladoga and Onega, and the barges were originally obliged to pass over them, heavy losses of property were frequently incurred by the barges being swamped during the gales to which the lakes are subject. To avoid this dangerous navigation, canals have been made along the southern shores of the lakes. The Lake of Bieloë and its outlet the river Cheksna have recently afforded the means of uniting by one system of canals the river Dwina and Archangel with the river Volga, and with the city of St. Petersburg.

In the year 1825 was commenced what must be considered the most important of the canals of Russia, that of the Moskwa and Volga. The abundant produce of the fertile country which lies to the south and east of Moscow, was, before the execution of this canal, conveyed to the Baltic by a very circuitous route. A canal of 100 miles saves 900 miles of river navigation. It extends from the Volga near Twer, to the Moskwa near Moscow, making use of two portions of river navigation in its way. There are a few other canals on the outskirts of the empire.

Climate.—The fact that the intensity of cold in Europe increases from west to east is illustrated by the climate of Russia. While the mean annual temperature of the western coast of Norway as far north as North Cape is always above 32°, the vast region of Russia in the same latitudes has a mean temperature below 32°. We may term this region the Arctic Region. Southward of this comes the Cold Region, in which the mean annual temperature varies between 32° and 40°. The southern limit of this region begins on the shores of the Baltic, on the Gulf of Riga, about 58° N. lat., and extends to the Ural, which it touches at about 51° N. lat. The Neva is generally covered with ice for 160 days, from the 27th of November to the 19th of April. Both spring and autumn are short, and the passage from cold to heat, and vice versâ, is rather rapid. But in summer the heat is for two or three weeks very great. At Casan the thermometer in winter generally descends to 28° below zero, and in summer it rises to 95° and 96°. The Temperate Region extends over the southern provinces, as far north as the line above mentioned. Its mean annual temperature varies between 40° and 50°, but in the Crimea and in the country between the Dniester and Danube it rises to 54° and 56°. This region is distinguished by severe though short winters, and by long and very hot summers. The frost is severe, the thermometer generally sinking in the western districts to 12° below zero, and in the eastern to 20°. In the middle of May a sudden change takes place. In a few days the heat increases to such a degree as to become oppressive. In June and July it still continues increasing, until the thermometer attains between 90° and 100°. The countries which border on the Baltic and on the White Sea have a wet climate, and rain is frequent all the year round: in winter a considerable quantity of snow falls.

Productions.—Russia produces much more grain than is required for the consumption, and consider-

able quantities are exported, especially rye. The greatest quantity of rye is produced between the cataracts of the Dnieper on the south and the river Volga on the north. The cultivation of barley extends to 67° N. lat. Oats do not succeed north of 62° N. lat. Wheat is the principal object of agriculture in the fertile tracts along the rivers in the southern districts, but especially in the Ukraine. Millet is extensively grown in the elevated country which surrounds the upper course of the Oka, Don, and Desna, and in a few other places south of 55° N. lat. At the southern extremity of Russia, and up to 48° N. lat., Indian corn is cultivated. Flax and hemp are more extensively grown than perhaps in any other country in Europe: both the climate and the soil are very favourable to their cultivation. Tobacco is much cultivated in the Ukraine, whence it is exported to the neighbouring countries.

The climate of Russia is not favourable to the cultivation of fruit-trees. With the exception of wild cherries and some bad apples, no fruits grow north of 56° N. lat. In the most southern districts there are peaches, apricots, quinces, mulberries, and walnuts; and in the numerous and extensive orchards of the Crimea there are also almonds and pomegranates. Grapes are grown in a few spots. Potatoes, cabbages, turnips, and carrots, are extensively grown; and in some places cucumbers, pumpkins, and radishes. Melons, asparagus, hops, and liquorice, are among the vegetable produce.

The forests constitute one of the principal sources of wealth to Russia, and their produce, consisting of timber, fire-wood, tar, pitch, pearl-ash, and potash, is exported to a large amount. About three-fourths of the countries between 65° N. lat., and the course of the Volga as far east as its great bend near Casan, are covered with forests. In all these countries only pine, fir, larch, alder, and birch are found, with a few lime-trees; ashes are rare. From these countries is derived the greatest part of the produce of the forests which goes to foreign markets. The central provinces have in most cases no more timber than is required for their own use. West of the Dnieper several extensive forests occur on the banks of the Niemen and in the swamps of Pinsk and Ratnor. South of the swamps there are some forests of beech. The oak-forests of Casan, Nischnei-Novgorod, Pensa, and Saratov, have engaged the attention of government, on account of their great importance for the navy. The southern provinces of Russia are almost without trees.

The domestic animals of England are found in Russia, with the exception of rabbits. Horses are very numerous, and of various breeds. Black cattle are abundant, as is evident from the immense quantities of tallow and hides which are exported, though the domestic consumption of both articles is very great. Sheep are still more numerous; and the breed has been greatly improved within the last few years. Goats are more numerous in Russia than in other countries of Europe: the skins are used for making marocco leather. Hogs are generally reared, except in the steppes. The nomadic tribes which wander about in the steppes keep a great number of camels: some rich proprietors have herds consisting of more than 1000 head. In the government of Astrakhan buffaloes are kept, but they do not appear to be numerous. Fowl, geese, and ducks are abundant; the two latter especially in those parts where there are numerous lakes and ponds. Reindeer are only kept north of 66° N. lat. The European bison still exists in the forest of Bialoviza. In the extensive northern forests there are elks, deer, hares, and wild hogs. The wild animals, which are killed for their skins, are also very numerous, as bears, gluttons, badgers, wolves, foxes, martens, polecats, weasels, ermines, otters, squirrels, and marmots. In the steppes there are wolves, foxes, and wild hogs, wild asses, and saiga-antelopes. Nearly all kinds of birds which are met with in England occur in Russia, and also the capercailzie and pelican.

Russia contains minerals in great abundance. Gold is found chiefly in the Ural Mountains, partly on the European side, but mostly on the Siberian side. The produce in 1846 was as follows:—

	Poods.
Private Mining . .	1490
Public Mining . .	187
	1677

The total quantity obtained in 1847 was 1779 poods. The produce in the ten years 1837-46 was 8,387 poods of fine gold, which, at 36 lbs. avoirdupois = 1 pood, amounts to 366,847 lbs. troy, value 18,761,310*l*. Platinum was discovered in the Ural in 1823, and has been worked ever since; the produce in 1843 was 213 poods=7668 lbs. Silver is met with only in the Asiatic governments. The quantity obtained in 1847 was 1190 poods. Copper and iron are extensively worked in the Ural, and in other places. Mercury, arsenic, nickel, cobalt, antimony, and bismuth, are met with, but are not much worked. Salt is found in various lakes, and a salt-formation extends along the western declivity of the Ural Mountains, to the source of the Kama, and thence westward on both sides of the Uwalli. In all these districts salt is made from the salt-springs, which are numerous. Coal exists in a few places, but not in large quantities. Other minerals are not much worked, with the exception of marble and granite.

Inhabitants.—Russia is inhabited by a greater number of nations, differing in language, character, and civilisation, than any other country of Europe. The inhabitants belong either to the Caucasian or to the Mongol race. The Caucasian however is by far the most numerous. In fact the nations of Mongol origin do not comprehend one-hundredth part of the whole population.

The Caucasian race in Russia consists of Slavonians, Tshudes or Fins, Tartars or Turks, Germans, Jews, and Greeks. Nine-tenths of the population belong to the Slavonians. They are divided into Russians, Poles, Lithuanians, Lettes, Wallachians, and Servians. The Russians constitute more than two-thirds of the whole population, and their number is estimated at about 40 millions. They

inhabit, to the exclusion of all other nations, the central provinces of the empire between the Dnieper and the Volga: in other provinces they are mixed among other races. They are divided into Great and Little Russians. The latter inhabit the country called the Ukraine. The Cossacks are properly their descendants. [COSSACKS.] The Great Russians are mostly bondsmen to the rich nobles who live among them.

The Poles inhabit the governments of Volhynia, Podolia, and Grodno, and more especially the Polish provinces. In the arts of civilised life, especially in manufactures, and all branches of industry, they are behind the Russians, though more polished in manners.

The Lithuanians inhabit the governments of Wilna and Minsk. They are agriculturists, but otherwise they have not made much progress in civilization. North of the Lithuanians, in Courland and Livonia, are the Lettes, who speak a language different from that of the Russians and the Lithuanians. They are exclusively occupied with the cultivation of the ground. Those who live in Courland are frequently distinguished by the name of Koors. Both nations, the Lithuanians and Lettes, were bondsmen to the German nobility established in their country till the reign of the Emperor Alexander, who effected their emancipation.

The Vlaches, or Wallachians, only live in the government of Bessarabia, adjacent to the Turkish border. A few Servians dwell among them.

The Tshudes, or Fins, inhabit many of the northern provinces. [ESTHONIA; FINS; LAPLAND; LIVONIA.] Besides the western or Baltic Fins, there is another great eastern division, separated from the western by an immense tract of country upwards of 500 miles in width, which is now inhabited by Russians. When and how the separation took place is not on record. The eastern Tshudic tribes live on the western declivity of the Ural Mountains, and on the banks of the middle Volga.

The third great branch of the Caucasian family which inhabits Russia is the Turkish. They are generally called Tartars, but they call their language Turkish. They did not originally inhabit any portion of Russia, but came into it between the 9th and 13th century with the Mongols and other conquerors. The Turkish tribes at present existing in Russia are four, the Tartars of Casan, the Bashkirs, the Metsheriakes, and the Nogai Tartars. The Tartars of Casan are the most civilised of the Turkish tribes. The Bashkirs inhabit both declivities of the Ural Mountains, from 56° N. lat. southward to the sources of the river Ural near 54° N. lat.: they still adhere to a wandering life. The Metsheriakes live dispersed among the Bashkirs, and subsist on the produce of their herds of cattle and of their bee-hives. The Nogai Tartars inhabit the Crimea and the steppe which extends north of the peninsula; they are also dispersed over the country east of the Sea of Azof, and along the northern base of the Caucasus; some of them display considerable industry, while others are nomadic.

The number of individuals belonging to the Teutonic family is probably larger than that of the Turks. They are Germans and Swedes, with whom a few Danes are mixed. Numerous families of Germans are dispersed through the provinces along the Baltic, in the two capitals of the Empire, along the middle course of the Volga, and in the sea-ports. The Swedes are numerous along the northern coast of the Gulf of Finland, and the eastern coast of the Gulf of Bothnia. The Jews are numerous in the governments of Vilna, Grodno, Volhynia, and Podolia, where they are almost the sole inhabitants of the towns. The Greeks are dispersed all over the southern provinces of the empire as merchants; and in the Crimea there are a few villages entirely inhabited by them. They occupy themselves with agriculture, especially gardening.

The Calmucks show their Mongol origin by the form of their body, as well as by their language. The tribes of this nation which still exist in the south-eastern steppes of Russia are the remnant of those which left Russia in 1770 and 1772, at the invitation of the Chinese government, and settled in the plains of Soongaria. They are divided into five tribes. The first tribe is the most numerous, consisting of 12,000 families; the other four tribes, taken together, probably fall short of that number. In summer a part of them live chiefly on the produce of the chase, of which the saiga antelopes are the principal object, but in winter they depend only on their herds. They wander about with their flocks and herds in the immense steppes. In a country which has hardly a few patches of cultivable land, the Calmucks by able management have succeeded in maintaining horses, cattle, camels, sheep, and goats, to the number of three millions of heads. The value of the goods exported from their country to other parts of Russia is estimated at one million and a half of rubles. They consist of wool, hair, tallow, lamb and sheep skins, hides, and fur. The Calmucks are Buddhists. They have the different classes of priests found among the Buddhists, and were formerly subject to the ecclesiastical authority of the Dalai Lama, who resides at L'hassa in Tibet, but in 1800 the Emperor Paul induced them to choose their own Great Lama, to whom all the other lamas and priests are subject. The Calmucks are not immediately subject to the governor of Astrakhan, but have their own political administration, of which the khan of one of the tribes is the head. He is assisted by eight councillors and judges, and a person sent from St. Petersburg.

Manufactures, Commerce, &c.—The manufactures of Russia commenced, as in other countries, with the beginning of its political importance, but have been chiefly indebted for their encouragement and progress to the efforts of the government. The czars Ivan I. and II., who in the 15th and 16th centuries had restored Russia to independence, invited artisans and workmen from Germany, the Netherlands, and Italy, and established at Moscow, Yaroslaw, Smolensk, and Kiev manufactures of woollen cloth, linen, arms, &c. But the civil wars before the accession of the house of Romanoff, and the interference of

Sweden and Poland, which led to the desolation of the country, checked the infant manufactures, so that in fact nothing was done till the reign of Peter the Great, who in this, as in many other respects, was the founder of the prosperity of Russia.

The number of manufactories existing in Russia at the beginning of 1839 was 6855, and that of the workmen employed in them 412,931, not including those that work in the mines, and in the furnaces, smelting-houses, &c. dependent on them. Among the chief branches, the following were the numbers:—Manufactories of woollen goods, 616; silk goods, 227; cotton goods, 467; linen of all kinds, 267; tanneries, 1918; tallow melting-houses, 554; candle manufactories, 444; soap manufactories, 270; metal-wares, 486. The central part of the empire is the chief theatre of manufacturing industry. Moscow has become the focus of it; in the little towns of the government of which it is the capital, the number of manufactories continues to increase. Next to Moscow, are the governments of Vladimir, Nischnei-Novgorod, Saratov, and St. Petersburg.

The inland trade is carried on in a very great measure by means of annual fairs, the most remarkable of which is that of Nischnei-Novgorod. [NISCHNEI-NOVGOROD.] The number of these great commercial fairs is somewhat over twenty; but there is a still larger number of minor fairs and markets.

The inland trade is greatly promoted by the extensive system of inland navigation. The vessels which have arrived from the interior at the ports of Archangel, St. Petersburg, and Riga, have frequently amounted in the year from 2500 to 3500 barks. Goods destined for Odessa from the interior are carried down the Dniester or the Dnieper, and from the mouths of those rivers to Odessa by coasting-vessels. Cherson, Astrakhan, Taganrog, Nakhitschevan, and Rostow, are the other chief ports.

A railway from St. Petersburg to Moscow is now (March, 1850) partly opened.

The ships which entered and cleared at the various Russian ports in 1840 had an aggregate tonnage of 1,790,000 tons; of which those to and from Great Britain measured 712,000 tons. The Russian vessels which entered and left British ports in 1848 were—inwards, 277 vessels (76,108 tons); outwards, 190 vessels (52,777 tons). The British trade at Russian ports in 1848 involved the use of — Inwards, 2562 vessels, 565,304 tonnage, 23,682 men; Outwards, 1916 vessels, 404,268 tonnage, 17,931 men.

The cotton imported into Russia in 1841 was 314,301 poods, = 11,314,836 lbs., of which two-thirds came from Great Britain. The imports into Russia from Great Britain in 1840 were valued at 75,753,198 paper rubles; and from all countries 268,491,384; which, at 10¾*d.* for the paper ruble, gave a value in sterling of 12,026,176*l.* The declared value of the British and Irish produce and manufactures transmitted to Russia in 1847 was 1,844,543*l.*; the following were the chief items: — Coals, 108,378 tons; woven cottons, 1,541,112 yards; cotton twist and yarn, 12,853,754 lbs.; earthenware, 345,421 pieces; hardware and cutlery, 7,676 cwts.; iron and steel goods, 15,732 tons; lead and shot, 1,764 tons; machinery and mill-work, 226,636*l.*; salt, 2,318,584 bushels; tin, 6,268 cwts.; woollens and worsteds, 57,720*l.*; ditto yarn, 1,727,850 lbs., = 189,014*l.* The British and Irish merchandise imported into Russia in 1847 was valued at 1,844,543*l.*

The exports from St. Petersburg in 1844 amounted in value to 1,466,426*l.* The exports from Russia to Great Britain in 1840 amounted in value to 133,782,736 paper rubles; to all countries, 287,329,518 paper rubles, = 12,869,968*l.* Of the whole import and export trade of Russia in that year, Great Britain took 38 per cent. The exports from Russia in 1843, amounting in English sterling to 12,680,000*l.*, comprised chiefly the following five items—Wheat, 1,960,536*l.*; Tallow, 1,899,480*l.*; Flax, 1,553,480*l.*; Linseed and Hempseed, 1,321,400*l.*; Hemp, 887,720*l.* The exports for European Russia to the various Asiatic countries amounted in 1841 to 1,763,400*l.*; the imports from those countries to 2,415,000*l.* The exports from Russia, by way of the land frontiers, into Prussia, Austria, and Turkey, in 1843, amounted to 1,958,000*l.*; the imports, to 2,223,840*l.*

The Russian tariff underwent many alterations in 1844–5–6, whereby a nearer approach than before was made to the principles of freedom in commerce. Some articles, before prohibited, were made admissible at a high duty; in others, the duty was lowered from a high to a less percentage; in others, the whole duty was removed. The nature of the trade between Russia and Great Britain is indicated by the chief exports from the former to the latter in 1847, namely—Bristles, 1,278,570 lbs.; corn, 2,000,000 quarters; flax and tow, 681,167 cwts.; hemp, 542,857 cwts.; linseed, 353,900 quarters; tallow, 939,946 cwts.; tar, 9,656 casks; timber, 220,000 loads; wool, 2,949,776 lbs.

Government and Administration.—The Emperor of Russia is as absolute as in the times of Ivan Vasilovitch the Terrible. Several classes of the inhabitants enjoy certain privileges and immunities, though these liberties have no other guarantee than the pleasure of the monarch, who may abolish them just as he granted them. A remarkable feature in the political organisation of Russia is, that no one has of right any rank unless such as he obtains by filling a civil or military office.

The inhabitants of Russia are divided into the following classes: clergy, nobility, merchants, burghers, and peasants. The *Clergy* is composed of the monastic or regular clergy, and the secular clergy. [RUSSIAN CHURCH.] The *Nobility* is the privileged class, and in some degree the ruling class, in Russia. From the year 1762 till within the last few years, the privileges of the nobles were very great, but they have been considerably reduced of late years. The *Merchants* are divided into three classes or guilds, which have different degrees of power and privilege. Both the first and second classes enjoy an exemption from the

capitation-tax, military conscription, and corporal punishment. They may possess estates with serfs, provided the serfs are employed in manufactories. Their children enter the service on the same footing as those of the personal nobles. Nobles who engage in commerce may enter one of these three guilds, according to the extent of their transactions. Foreign merchants trading in Russia must pay the same taxes as the Russian merchants, and their commerce is subject to several limitations. They may acquire real property in places where they are settled. The *Burghers*, by purchasing an annual licence, the price of which, according to the class of the town which they inhabit, varies from 1*l.* to 3*l.*, may engage in several kinds of retail trade, and have workshops, in which they may employ, besides their family, eight workmen, and by doubling the price of their licence, sixteen workmen. Should they wish to increase that number, they must pass into the third guild of merchants. Those who pay no licence can engage in certain ordinary trades, and have a single shop for retailing certain specified goods. The burghers are not exempted from the capitation-tax, military conscription, or corporal punishment. The *Peasants* constitute the lowest class of the inhabitants of Russia. They pay the capitation-tax and are subject to military conscription. Besides their agricultural pursuits, they are allowed to engage in handicrafts and some minor trades, as keeping inns in villages, &c. By purchasing licences they may engage in any kind of commerce, even that which is carried on by merchants of the first guild, but they do not enjoy the personal privileges of the merchants. They are divided into crown peasants, those of appanage estates, serfs of landowners, and free cultivators of land. The crown peasants are those who live on the estates belonging to the crown. They pay, besides the capitation-tax, a rent for their grounds. Many villages are obliged to maintain post-horses for the government couriers and private travellers. The landowner's peasants, or serfs, are complete slaves. Their master may punish them in any way he pleases short of maiming or killing them. The free peasants, a class whose existence began under the Emperor Alexander, are subject to the capitation-tax and military conscription, but they are free in all other respects.

The principal authority in the Russian Administration is the Council of the Empire, presided over either by the Emperor or by a member specially appointed. It is divided into four departments:—1, the legislative; 2, the military (which comprises also the navy); 3, that of civil and ecclesiastical affairs; and 4, the financial. Each of these departments has a secretary of state, and they deliberate either separately or together. Their decisions are submitted to the approbation of the Emperor.

The Senate, or, as it is officially called, the Directing Senate, was established by a ukase of Peter the Great in 1711, and its organisation was determined by the ukases of 1772 and 1802. It is divided into eight departments, of which the 1st superintends the general affairs of the country; the 2nd, 3rd, and 4th try civil cases; and the 5th, criminal cases: these are all at St. Petersburg. The 6th, which also tries criminal cases, and the 7th and 8th, which try civil cases, are at Moscow. Each of these departments has a number of governments or provinces, from the courts of which it hears appeals.

The administration of the country is conducted by ministers of foreign affairs, interior affairs, war, marine, national education, &c.

The governments or provinces are each ruled by a civil governor, vice-governor, procurator, court of appeal, tribunal of conscience, board of public charities, and medical board.

The districts into which the governments are divided, contain each a marshal of the nobles, a district tribunal, a board of police magistrates, and a council of the nobles.

The towns have their separate jurisdiction, composed of the burgomaster and ratmans (from the German rathmänner, councilmen), who are elected from the merchants and burghers of the town. There is also a council of tutelage for minors of the burgher class.

History.—The history of Russia cannot properly be said to commence before the middle of the ninth century of the Christian æra. About A.D. 850 a Baltic freebooter, named Rurik, who had been called in by the people of Novgorod to defend them against their neighbours, made himself master of great part of the country, and founded a dynasty which continued to rule uninterruptedly till A.D. 1598. The reign of St. Vladimir the Great (980–1015) was the æra of the conversion of Russia. Vladimir, who had married Anna, sister of the Emperor Basil II., became a Christian according to the Greek church in 988, and his example was speedily followed by his boyars, or nobles, and all his subjects. Vladimir was a great prince, and extended his dominions on all sides by conquests; but after his death much anarchy ensued, which lasted with few intervals till Andrew I., Prince of White Russia (1057–75), arrogated to himself the title of grand-prince of Russia, while the elder line reigning at Kiev sunk into a subordinate rank; and Novgorod, though still retaining the forms of princely government, had become in effect a free republic, and was the centre of an extensive traffic with both Europe and Asia. The annals of Russia present only an unceasing succession of devastating struggles between the different principalities, until 1223, when a host of 500,000 Tartars under Toushi, the son of Genghis-Khan, encountered and overthrew the combined forces of the Russian princes on the river Kalka, near the Sea of Azof: and between that date and 1240, the whole of Russia was subdued by the Tartars.

For more than two centuries and a half after this conquest Russia continued to be held in abject vassalage by the Tartars of Kapchak, whose hordes overspread the eastern and southern provinces, and the plains between the Caspian and the Volga, on the banks of which river the Golden Horde, or imperial residence of the khans of the race of Batu, was fixed; but the interior of the country was still left under the government of the native princes, who were compelled

to present themselves at the Golden Horde to receive investiture and to perform homage. The grand-prince of White Russia continued to be considered as the head of the Russian nation, subject however to constant intrigues from other quarters. In 1320 the grand-prince removed the seat of government from Vladimir to Moscow; while the principality of Kiev was finally extinguished (1321) by the Duke of Lithuania, who conquered and annexed it to his own dominions. In the mean time Novgorod had risen in commercial importance till its inhabitants had numbered 400,000; but the remainder of Russia continued to be held in hopeless bondage till 1361, when the death of the Tartar Khan gave renewed hopes to the Russians; and from that time till 1480, when Ivan III. shook off the last vestige of dependence on the Golden Horde, there was a perpetual series of struggles between the Russians and Tartars. During this period Moscow was twice burnt, in 1382 and 1441.

With the reign of Ivan III. a new epoch commences in the history of Russia. He defeated the Poles and Lithuanians, reduced the Tartars of Casan to tribute, and reunited under his authority most of the minor Russian principalities; but his capture of Novgorod (1475), and the exactions which he levied on the merchants and citizens, gave a death-blow to the commerce of that famous emporium. He ranks as the founder of the Russian Empire, the power and splendour of which date from him. During the reign of his successors, Basil IV. (1505–33), Ivan IV. (1533–84), and Feodor (1584–91), the power of Russia increased rapidly. Basil was almost constantly at war, either with the Poles or the Tartars. Ivan was the first to assume the title of *Czar*. He took Casan in 1552, and Astrakhan in 1554, gained the submission of the Don Cossacks in 1559, and through their aid conquered the vast region of Siberia in 1581. He was an able but cruel prince. Feodor was imbecile; and his death in 1591 put an end to the male line of the house of Rurik, which had ruled under 56 sovereigns for 736 years.

Boris, the brother-in-law and minister of Feodor, was now placed on the throne by the clergy and nobles, and commenced his reign (1598–1605) by the emancipation of the serfs and other salutary measures; but he soon degenerated into an arbitrary and cruel tyrant. For nine years after his death, Russia was distracted by rival claimants to the throne; but in 1614, Michael Romanof, a descendant by females from the house of Rurik, was called to the throne with a unanimity among all orders in the state which the sense of imminent danger alone could produce. Russia now assumed its proper rank among European states. The long reign of Michael (1613–45) afforded him time both for the consolidation of his own power and the restoration of his dominions from the depression caused by the late calamities; but he was obliged to cede Ingria and Carelia to Sweden, and Smolensk to Poland. The internal administration of Michael was more fortunate than his wars. He succeeded in a great measure in redressing the abuses which the preceding anarchy had occasioned; and he gave a fresh impulse to trade by the conclusion of commercial treaties with England (1623) and with France (1629). The reigns of his successors, Alexis (1645–76), Feodor (1676–82), and Ivan (1682–89) were marked by the conquest from Poland of Tchernigow, Kiev, and the Ukraine, and by the prosecution of successful wars with the Swedes and the Turks.

Peter the Great, who had reigned jointly with his brother Ivan for seven years, under the guardianship of their mother Sophia, ascended the throne in 1689. [PETER I.]

In obedience to the last commands of Peter, his widow Catherine, was proclaimed empress; but her short reign (1725–7), and that of her successor Peter II., (1727–30), were not marked by any important events. On the death of Peter II., Anne, daughter of Ivan, the elder brother of Peter the Great, was called to the throne (1730–40). Anne bequeathed the succession, under the regency of her favourite Biron, to her grand-nephew Ivan (1740–1), a child two months old, son of her niece Anne of Mecklenburg, by Duke Antony of Brunswick-Bevern. Biron was speedily overthrown by a cabal headed by the parents of the infant emperor, who themselves assumed the guardianship; but the discontent of the Russians at the influence of the foreign ministers introduced by Anne at length broke out in revolt; and Elizabeth, daughter of Peter the Great by Catherine, was called to the throne (1740–62). [ELIZABETH PETROWNA.] Elizabeth died Jan. 1762, and was succeeded by her nephew, Peter III., Duke of Holstein-Gottorp. He soon disgusted his subjects, and, after a reign of six months, he was dethroned (July, 1762) by a conspiracy, and died in prison a week afterwards, as is generally supposed by violence. His widow, Catharina II., was called to the throne by the unanimous voice of the army and the people.

The accession of this ambitious and unscrupulous princess (1762–96) gave a fresh impulse to Russian policy, which from this time assumed the steadily aggressive character which it has ever since maintained. [CATHERINE II.] She was succeeded by her son Paul (1796–1801), a weak and fickle prince. In 1800 Paul put himself at the head of a union of the northern states of Europe, on the principle of an armed neutrality against the British maritime supremacy, and a war with England was impending, when he was murdered in his palace (1801) by a band of conspirators.

His son and successor Alexander in 1801 effected a pacification with England, and died in 1825. [ALEXANDER, i., 437.] Leaving no issue, Alexander was succeeded by his brother Nicholas, the present Emperor of Russia, who is the third son of Paul; the second son, Constantine, having previously renounced the succession.

RUSSIAN CHURCH. The Russian Church is a branch of the Eastern or Greek Church, whose missionaries seem to have penetrated among the Slavonian population that inhabited the countries to the north of the Black Sea at an early period, and to have made many converts before the end of the ninth century.

The Emperor is the head of the Church, the

affairs of which are administered by a supreme council, called 'the Most Holy Governing Synod,' composed of ecclesiastical and lay members, whose number is not limited.

The Russian Church contains forty dioceses, divided into three classes: the first (containing four dioceses) is governed by metropolitans; the second (sixteen dioceses) by archbishops; and the third (containing the remaining dioceses) by bishops. All those prelates who are comprehended under the general appellation of archiverey differ only in rank, and do not depend on each other, but immediately on the synod. Each diocese has a consistorial court, whence an appeal may be made to the archiverey, and from him to the synod. The highest preferment to which the secular clergy can attain is the rank of chief priest of the imperial staff, and the individual who occupies that place is generally also the confessor of the sovereign, and has a voice in the synod.

There are four ecclesiastical academies in Russia—at Moscow, St. Petersburg, Kiev, and Casan, besides numerous seminaries. All the sons of the clergy must be educated in these seminaries, many of which contain colleges, called Burses, in which the poorer students are maintained gratis. This compulsory system of education has had the effect of making many of the sons of clergymen the most learned men in Russia. The clergy form a kind of separate body in Russia, and it is a rare occurrence that a person belonging to another class enters the church. The sons of clergymen are, as a general rule, obliged to follow the profession of their parents.

There are numerous dissenters from the Russian Church, generally called *Raskolniks*, from the Russian verb *raskolot*, to 'split,' which signifies dissenters or schismatics. The beginning of this dissent dates from the introduction of Christianity into Russia. The principal dissent in the Russian Church was caused by the emendation, towards the end of the 17th century, of the corrupted text of the Slavonian version of the Scriptures, and other sacred books in the same tongue, which are used by the Russian Church. The text of these books, transcribed by ignorant copyists during the dark ages of the Tartar domination, had previously been disfigured by omissions, and still more by the additions with which some ignorant transcribers attempted to supply the omissions. The adherents of the old text, who are designated by the general appellation of Raskolniks, or Dissenters, call themselves *Starovertzee*, which signifies 'those of the old faith.' The name which is now usually applied to them, even officially, is that of *Staroobradtzee*, that is, 'those of the old rite.' But although these appellations are in general indiscriminately applied to all those who dissent from the established church of Russia, yet there are essential differences of opinion among them, both in respect of tenets, ceremonies, and discipline. One great division consists of the *Popovshcheena*, or those who have priests; and another of the *Bespopovshcheena*, or those who have no priests. This latter class comprehends a great variety of sects, most of which have no common characteristic except the absence of ordained priests.

RUSSIAN LANGUAGE. [SLAVONIANS.]

RUST, in the common acceptation of the term, is the red pulverulent substance which is formed on the surface of iron when exposed to air and moisture. It is an oxide of iron.

RUSTICATED WORK, in Architecture, a species of decoration for walls, wherein the joints between the courses, and between the separate stones in each course, are strongly defined by sunk channels or grooves. Rustication gives an appearance of solidity to the surface, and was frequently employed by the Romans. Italian architecture presents many examples of rusticated work, and there are several specimens among the public buildings of London.

RUTA, the name of a genus of plants belonging to the natural order *Rutaceæ*. De Candolle enumerates 24 species of *Ruta*, of which comparatively few are generally known or cultivated. The species which has been longest known and most used, and perhaps the handsomest for culture, is the *Ruta graveolens*, Common Rue.

Rue is a native of the south of Europe, a glaucous half-shrubby plant, of a peculiar yellowish green colour. Every part of it is marked by transparent dots, filled with volatile oil. The leaves and immature fruits are officinal, and owe their virtue to the volatile oil and a bitter extractive. The odour is peculiar, strong, and penetrating; the taste intensely bitter, aromatic, and stimulating. Rue possesses powerful stimulant, antispasmodic, and tonic properties. The careless handling of the fresh plant sometimes causes rubefaction and vesication, and its improper employment internally has produced serious results. When judiciously used, it is very serviceable in hysteria and other convulsive disorders.

Rue is sometimes called Herb of Grace, and in some parts of England, Ave Grace. This name is said to have been given to it on account of its use in exorcisms. In company with rosemary it has been used from time immemorial as an emblem of remembrance on account of its evergreen foliage.

Rue is frequently cultivated as an ornamental plant, for which its curiously cut leaves, their glaucous hue, and the profusion of fine dark yellow flowers appearing for several months in succession, adapt it exceedingly well. It may be increased by seeds, slips, or cuttings.

RUTA'CEÆ, a natural order of Polypetalous Exogens. They are trees, small shrubs, or herbaceous plants.

Many of the plants of this order emit a powerful and usually offensive odour from the glands that cover their whole surface. These glands are sometimes so full of a volatile oil, that in hot weather the atmosphere surrounding the plant becomes charged with it. The *Diosmas*, or Bucku plants, are used in medicine as antispasmodics. The Angostura Bark is produced by a plant (*Galipea officinalis*) belonging to this order.

RUTH, BOOK OF, a canonical book of the Old Testament, which seems to have been inserted in the sacred canon as a necessary link in establishing the genealogy of David, and consequently of the Messiah; and perhaps also to furnish a record of the fact that one of the

Messiah's ancestors was a Gentile, thus intimating the great truth that the Gentiles were to have a part in the highest privileges of the Jews. In the ancient Jewish canon this book forms a part of the Book of Judges, because the events recorded in it happened during the rule of the Judges. Its exact date is however uncertain, but most probably the famine mentioned in verse 1 is that which happened in the time of Gideon, about B.C. 1241. It is generally supposed to have been written by the prophet Samuel.

RUTHERFORTH, THOMAS, D.D., was born in the parish of Papworth-Everard, Cambridgeshire, in 1712. Having taken his degree and obtained a fellowship in St. John's College, Cambridge, he was appointed Regius Professor of Divinity in the university, and created D.D. He died in Oct. 1771.

Among Dr. Rutherforth's works are, 'Ordo Institutionum Physicarum in privatis suis Lectionibus,' Camb., 1743, sm. 4to.; 'Essay on the Nature and Obligations of Virtue,' Lond., 1744, 8vo.; 'Institutes of Natural Law, being the substance of a Course of Lectures on Grotius De Jure Belli et Pacis, read in St. John's College, Cambridge,' Lond., 1754–56, 2 vols. 8vo.

RUTHERFORD, DANIEL, was born at Edinburgh, in November, 1749, and educated at the university of his native city. In 1772 he took his degree of M.D., and it was in the thesis which he printed upon this occasion, entitled 'De Aere Mephitico,' that he announced the discovery of the gas which has since been called azote or nitrogen; for Rutherford merely indicated its existence as a peculiar air, and neither gave it any name nor explained its properties. The same discovery was also made about the same time by Dr. Priestley. Dr. Rutherford was admitted a fellow of the Edinburgh College of Physicians in 1777, and in 1786 he was appointed professor of botany in the university. He died Nov. 15, 1819.

RUTHERGLEN. [LANARKSHIRE.]

RUTHIN. [DENBIGHSHIRE.]

RUTI'LIUS LUPUS, a Roman rhetorician, who was a contemporary of Quinctilian. We possess a small treatise of his on rhetoric, entitled 'De Figuris Sententiarum et Elocutionis;' which was taken from a work of a contemporary of the name of Gorgias, in four books. The treatise of Rutilius is now divided into two books, but Quinctilian says that it was only in one. It is several times quoted by Quinctilian, and is still valuable for the quotations which it contains from writers now lost. One of the latest editions of Rutilius is by F. Jacob, Lüb., 1837, 8vo.

RUTI'LIUS NUMATIA'NUS, CLAUDIUS, a Roman poet at the beginning of the fifth century of the Christian æra, was a native of Gaul, and held at Rome the high offices of magister officiorum or palatii, and præfectus urbi. Having occasion to return to his native country, he gave an account of his voyage, in a poem entitled 'Itinerarium,' written in elegiac verse, and consisting of two books, of which the greater part of the latter is lost. The best edition is by Zumpt (1840).

RUTLAND, a small county of England, is bounded N. and N.E. by Lincolnshire, S.E. and S. by Northamptonshire, and W. by Leicestershire. It is of compact form; the greatest length N.E. to S.W. is 19 miles; the greatest breadth at right angles to the length is 14 miles. The area is 149 square miles. The population in 1841 was 21,302.

Surface, Geology, and Rivers.—The north-eastern part of the county consists of a somewhat elevated plain or table-land, skirted on the southern side by the valley of the Wash, which opens on the west into the more expanded vale of Catmoss. The rest of the county consists of valleys whose general direction is E. and W., divided from each other by narrow ranges of low hills. There are no very elevated points in the county.

The county is included in the district occupied by the lower formations of the oolitic series. The great oolite forms the north-eastern table-land above mentioned, and occupies also the higher ground on the eastern side of the county: the prevailing rock is a close-grained limestone. The remainder of the county is occupied by the red or reddish-brown ferruginous sands which separate the great oolite from the subjacent lias. These are covered in many places, especially near their junction with the lias, which takes place just on the north-western border of the county, by vast accumulations of transported blocks of gravel. There are quarries of good building-stone at Ketton, between Stamford and Uppingham.

Rutland belongs chiefly to the basin of the Wash. The Welland, one of the rivers which flows into that æstuary, skirts the county on the S.E. side. This river is not navigable above Stamford, where it quits the county altogether. The river Guash, or Wash, rises just within the border of Leicestershire, and flows E. through this county into Lincolnshire, where it joins the Welland just below Stamford. The Chater also rises in Leicestershire, and flows parallel to the Wash: it joins the Welland just above Stamford. The Eye Brook bounds the county on the S.W., and joins the Welland just below Rockingham. The Wreak, which joins the Soar, a feeder of the Trent, rises in Rutland near Oakham, and flows N. through the vale of Catmoss into Leicestershire. The Oakham Canal is a prolongation of the Melton Mowbray Navigation, from Melton Mowbray in Leicestershire to Oakham. It passes through the vale of Catmoss, and has a total length of 15 miles, of which about $6\frac{1}{2}$ miles are in Rutland. The Syston and Peterborough Railway passes by Oakham.

Rutland is one of the grazing counties of England in which much attention has been paid to rearing choice animals, both oxen and sheep. There are many wealthy proprietors in the county, who more or less encourage agriculture in all its branches. The soil is mostly of a good quality; and the face of the country agreeably diversified, affording good sites for country-seats, parks, and pleasure-grounds: and the richness of some of the natural pastures has no doubt made it, from an early date, the residence of the richer clergy and gentry. The best pastures are on the lias clay.

The pastures are very similar to those of Northamptonshire, and there is no great peculiarity in the cattle and sheep bred or fed in them. There are some low meadows subject to be flooded along the rivers Welland, Guash, and Chater. The first of these having but little fall, the water goes off very slowly from the flat meadows by the side of it; hence the herbage is not of the best quality, and sheep fed there are apt to rot, which they seldom or never are subject to in the upland pastures.

The arable land was formerly but indifferently cultivated, as was the case in most parts of the country where grazing was the principal object of the farmer: but by the enclosure of common fields, and the extended cultivation of turnips, of which the value for the cattle in winter is now fully appreciated, a much greater quantity of corn is produced than would, at one time, have been thought possible; and by means of under-draining and an improved husbandry, the land which will produce good crops of turnips, especially the Swedish, is daily increasing.

Divisions and Towns.—Rutland is divided into 5 hundreds. It is in the diocese of Peterborough. It is in the Midland Circuit, and the assizes are held at Oakham. The county returns two members to parliament.

The following are the only market towns in the county, with their population in 1841:—

Oakham or *Okeham*, is 12½ miles W. by N. from Stamford by the Eastern Counties Railway, and about 6 miles N. from Uppingham. It had an ancient castle, erected probably by Walcheline De Ferreris, a younger branch of the family of De Ferrars, to whom Henry II. had granted the manor. Of this castle, the county-hall, in which the assizes are held, and the other business of the county and the town transacted, is a remain; the other parts are in ruins. The architecture is of late Norman or very early English. The town is neatly built. The church is a large edifice, mostly of perpendicular character. It has a fine tower and spire. Near the church is the school-house of a richly-endowed grammar-school. The Oakham Canal affords facilities for supplying the town with coal, and for sending corn to the manufacturing districts. There is a good market for corn. Population of the parish, 2726.

Uppingham is 6 miles S. from Oakham. The town consists chiefly of one street, tolerably well paved, with an open area in the centre. The houses are in general good, and the appearance of the place is superior to that of Oakham. The church is large, with a lofty spire, and contains several interesting portions. Population of the parish, 2034.

History and Antiquities.—This county appears to have been included in the country of the Coritani; and upon the Roman conquest of Britain was included in the province of Flavia Cæsariensis. Under the Saxons it was included in the kingdom of Mercia. From them it appears to have derived its name of Rutland, in Domesday 'Roteland,' which was perhaps given first to a part only of the present county. The antiquities are chiefly ecclesiastical. Tickencote, Little Casterton, Empingham, Essendine, and Ketton churches, all on the east side of the county, go back to the Norman period.

RUVO. [Bari, Terra di.]

RUYSDAEL, or RUYSDAAL, JACOB, born at Haarlem in 1635, was originally brought up to surgery, but eventually adopted painting as his profession. He probably received his first instruction in art from his elder brother Solomon, who was also a good landscape-painter. He died at Haarlem in 1681.

Ruysdael was a simple but accurate imitator of nature. Woods and waterfalls are the prevailing subjects of his landscapes. He never painted figures; those which are introduced into his compositions were painted by Ostade, Wouvermanns, Vandevelde, or Berghem. There are fine specimens of his works in most of the principal collections of Europe. The Stag-Hunt, in the Royal Gallery of Dresden, the figures of which are by Vandevelde, is generally reputed to be his masterpiece.

RUYTER, MICHAEL, born at Fleissingen in 1607, went to sea as a cabin-boy, and rose successively till in 1635 he was made a captain. He served for several years in the East Indies, and in 1645 was appointed rear-admiral. In 1647 he attacked and sunk off Sallee an Algerine squadron. In 1652 he was employed in the war against England. In 1653 he commanded a division, under Van Tromp, and was beaten by Blake, but had afterwards an advantage over the English near the Goodwin Sands. In 1655 he was sent to the Mediterranean to chastise the pirates of Algiers and Tunis. In 1659, when sent to the assistance of Denmark against Sweden, he defeated the Swedish fleet, and the King of Denmark gave him a title of nobility with a pension. In 1665 he fought against Prince Rupert of England with no decisive result, and in July of the following year he was beaten by the English. In June, 1667, he entered the Thames, sailed up the Medway, and destroyed some ships both at Chatham and Sheerness. In 1671 Ruyter had the command of the Dutch fleet which was to oppose the French and the English, and fought several battles without any important result. Towards the end of 1675 he was sent to the Mediterranean to support the Spanish interest against Louis XIV. of France, and fought a desperate battle with the French admiral Duquesne, off the eastern coast of Sicily, on April 22, 1676, in which his fleet was worsted, and Ruyter had both his legs shattered. He effected a retreat into the port of Syracuse, where he died of his wounds, April 29. A splendid monument was raised to him at Amsterdam.

RYCAUT, or RICAUT, SIR PAUL, was the tenth son of Sir Peter Rycaut, a merchant of London. The date of his birth is unknown, but he took his bachelor's degree in 1650, at Cambridge. In 1661 he attended the Earl of Winchelsea as secretary, when that nobleman went out as ambassador to Constantinople. He published the 'Capitulations, Articles of Peace, &c., concluded between England and the Porte in 1663,' and also 'The Present State of the Otto-

man Empire, in Three Books, containing the Maxims of the Turkish Politie, their Religion, and Military Discipline, illustrated with Figures,' London, 1668, 1670, fol. He was afterwards appointed consul at Smyrna, in which situation he exerted himself in extending the commerce of England with the Levant.

On his return to England, Rycaut published 'The present State of the Greek and Armenian Churches, Anno Christi 1678,' London, 1680, fol., and a 'History of the Turkish Empire from 1623 to 1677,' London, 1680, fol., which is a continuation of Knollys's 'History of the Turks.'

In 1685 the Earl of Clarendon, then lord lieutenant of Ireland, appointed Rycaut secretary of the provinces of Leinster and Connaught, and James II. created him a privy councillor of Ireland, a judge of the Court of Admiralty, and a knight. The Revolution of 1688 deprived him of all his employments, but in 1690 he was appointed resident to the Hanse Towns; he then went to reside on the Continent, and remained there till 1700, when he returned to England, and died Dec. 16, in the same year. He wrote and translated a few other works.

RYE. [Sussex.]

RYE is a plant of the family of the *Gramineæ*, and bears naked seeds on a flat ear furnished with awns like barley. The straw is solid, the internal part being filled with a pith, which makes it valuable for litter, and still more so for thatching. The value of the straw is often nearly equal to that of the grain. Rye grows on poor light soils which are altogether unfit for wheat. It was formerly raised in considerable quantities in England, either alone or mixed with wheat, and was then called *Meslin*, from the old French word *meslé*, which means *mixed*. The meslin when ground produced a very wholesome and palatable household bread. Rye is at present raised in very small quantities in England.

In England rye is mostly sown as a green crop, and when fed off early in spring with sheep, the land is invigorated, and will bear excellent potatoes or turnips the same year. This practice cannot be sufficiently recommended; and if the rye is sown very early in autumn, it may be fed off in October and November, when sheep-feed is beginning to fail and the turnips have not yet attained their full size, without any detriment to the succeeding spring produce.

The preparation of the land for rye is the same as for wheat, except that in very light soils no more ploughings are required than will clear the ground of weeds. If rye is sown after harvest, one ploughing only is usually given. It will thrive upon rich wheat soils, as well as upon lighter, and, as it throws out numerous stems in rich land, it is the more profitable as fodder, although the crop of grain might not be so abundant when the plants are too much crowded.

RYE-GRASS, sometimes called *Ray-Grass*, is one of the most common of the artificial grasses. It belongs to the family of the *Gramineæ*, and to the genus *Lolium*. There are several varieties, some annual and others perennial, some producing a strong juicy grass, and others a small diminutive plant. These varieties arise chiefly from difference of soil, climate, and cultivation. In the convertible system of husbandry, rye-grass performs a very essential part, especially the perennial sort, which, mixed with different varieties of clover and other grass-seeds, produces a rich and close herbage, which may be either mown for hay or depastured.

RYE-HOUSE-PLOT. [Russell, Lord Wm.]

RYLAND, WILLIAM WYNNE, was born in London in 1732, and apprenticed to S. F. Ravenet, a French engraver settled in England. He afterwards went to Paris, and studied there chiefly under Le Bas for five years. Soon after his return to England Ryland was appointed engraver to George III., with a pension of 200*l.* per annum. He engraved two portraits of George III. after Ramsay, and one of Queen Charlotte holding the Princess Royal on her lap, after Cotes, which was one of Cotes's principal works. Ryland's labours and life were however at once terminated by a sad event, which Strutt, in his 'Dictionary of Engravers,' scarcely alludes to. Ryland was executed for forgery in the prime of life, July 28, 1783.

The specific charge against him was for forging and uttering, knowing to be forged, a bill of 210*l.* on the East India Company. The evidence against him was not very conclusive, but the facts that he had tried to escape and had attempted suicide were deemed confirmatory. He died protesting his innocence to the last.

Ryland introduced chalk-engraving (lines composed of dots) into England, and in the latter years of his life devoted himself exclusively to engraving in this style, in which he had no equal. As an etcher, or where the needle and graver are combined, Ryland was also excellent. The prints which he engraved in France were executed in this style.

RYMER, THOMAS, was born in 1638 or 1639, and educated at the grammar-school of Northallerton. He was removed to Sidney College, Cambridge, and was entered of Gray's Inn, London, in 1666.

He does not appear to have attained any eminence in the law. He rather devoted himself to literature, and in Dec. 23, 1692, he was named historiographer royal, and appointed editor of the 'Fœdera,' a collection of important documents relating to the transactions of England with foreign powers, the first volume of which appeared in 1703. This work entirely changed the character of the histories of our own country, as may be seen by Rapin's 'History,' and it was hailed with great satisfaction by all the historical writers of Europe.

There are in the British Museum a great number of transcripts of documents made under Rymer's direction not used in his work. Rymer's first production was a play called 'Edgar, or the English Monarch.' He is also the author of a few translations and some works of criticism, chiefly relating to the drama. He died Dec. 14, 1714, in Arundel Street, in the Strand.

RYNCHOPS (or more correctly RHYNCHOPS), a genus of aquatic birds (order *Nata-*

tores), the affinities and position of which are differently viewed by various naturalists. According to Mr. G. R. Gray ('List of the Genera of Birds') it is intermediate between the Gulls and the Terns.

Generic Character.—Bill longer than the head, straight or nearly so, compressed, and in form resembling the blade of a knife, truncated, and with the appearance of having been broken at the point; upper mandible much shorter than the lower, and with a groove into which the lower mandible is received; nostrils marginal, median. Feet moderately long, slender. Wings very long; the first quills longest. Tail forked.

Scissars-Bill (*Rhynchops nigra*).

Example, *Rhynchops nigra*. This is the *Becen-Ciseaux* and *Coupeur d'Eau* of the French; *Scissars-Bill, Sheerwater, Cutwater, Skimmer*, and *Black Skimmer* of the Anglo-Americans.

The Scissars-Bill is about nineteen inches in length, with an expanse of wing giving a measurement of three feet six or eight inches. It is very extensively diffused; it ranges along the east and west coasts of America, is not uncommon on the coasts of Malabar and Coromandel, and on those of Senegal in Africa. Catesby describes it as frequent near the sea-coasts of the Carolinas, Lesson found it in thousands off the coasts of Concepcion (Chili), and Mr. Darwin observes that he saw it on the west and east coast of South America, between latitudes 30° and 45° S.; he adds that it is abundant far inland, along the course of the Rio Parana, where it is said to be stationary, breeding in the marshes.

Continually traversing the surface of the water, this extraordinary bird flies with the celerity of an arrow; and with the tip of the lower knife-like mandible cleaving the liquid surface it seizes its prey, namely, fishes and various crustacea. In this manner flocks of them skim to and fro busy in skimming the waves, uttering, as they dash along, loud harsh cries of exultation. The Scissars-Bill breeds in small flocks in marshes, on sand-banks, and low islands; the eggs are three in number, of a clear white, spotted with different shades of ash. The general colour of this species is dark umber brown, approaching to black over the wings and upper surface; forehead, cheeks, throat, and under parts, white; a slight bar of white across the wings; feet lead colour; mandibles orange-red at the base, becoming black at the tip; length of lower mandible about five inches.

RYOT. [Zemindar.]

RYSBRACK, MICHAEL, seems to have been born at Antwerp, June 24, 1693. He was the son of the landscape-painter Pieter Rysbrack, who placed him in 1706 with the sculptor Michael Vander Vorst. In 1720 Rysbrack came to London and distinguished himself by his small models in clay. His progress in London was at first slow, and his first work which attracted notice was a bust of the Earl of Nottingham. He was for some time engaged by Gibbs, who received from Lord Oxford 100*l.* each for the statues on Prior's monument in the south transept (or Poet's Corner) in Westminster Abbey, while he gave Rysbrack only 35*l.* each. Rysbrack however soon shook off all dependence on Gibbs. Engagements crowded upon him, and there was hardly a work of sculpture of any consequence undertaken in England that was not entrusted to Rysbrack.

Rysbrack, unlike most of the artists of his age, studied exclusively nature and the antique. He was a most industrious sculptor: fine works are to be seen by him in many parts of England, but especially in Westminster Abbey, at Blenheim, at Stourhead, and at Bristol. His busts were very numerous, and include those of many distinguished characters. His first great public work was the bronze equestrian statue of William III., which was made for the city of Bristol, and erected in Queen's Square there in 1733. He died Jan. 8, 1770.

RYSWICK, PEACE OF, was concluded in 1697, and terminated the war which had been begun in 1688 by France against Holland, England, Germany, and Spain, the parties to the league of Augsburg (1686) and the Grand Alliance (1689). Four treaties were upon this occasion signed in the royal palace of Ryswick. By the treaty with the United Provinces, Louis XIV. agreed to restore all his conquests from that power, and the Dutch in like manner gave back to France their conquest of Pondicherry in the East Indies. By the treaty with Spain, Louis restored Gerona, Rosas, and his other conquests in Cataluña, and also Luxembourg, Charleroi, Mons, and all the other places in the Low Countries. By the treaty with England, all conquests during the war were mutually restored; and Louis acknowledged William III. as lawful king of Great Britain. By the treaty with the Emperor, Louis restored Friburg, Philipsburg, and Brisac, and consented to the re-establishment of the Duke of Lorraine; and the Emperor ceded to France, Strasbourg and its dependencies. The general peace that followed the treaties of Ryswick lasted till 1702.

Ryswik, or Ryswick, is a village in Holland, a league from the Hague.

RYSWYK. [Holland.]

RZESZOF. [Galizia.]

S is the chief sibilant of the English alphabet, and is employed to represent two different sounds, as in *this* and *these*. The word *sugar* would seem to justify the addition of a third sound, *sh*; but in this word the vowel *u*, so often pronounced *yu*, has modified the pronunciation of the preceding consonant. *Syugar* would easily glide into *shugar*. In the Hebrew alphabet, whence those of Europe are derived, a common symbol is employed, with and without an affixed dot, to denote *s* and *sh*.

The letter *s* is subject to the following interchanges :—

1. *S* with *d*. [See D.]

2. *S* with *th* and *sth*, as in the Laconian dialect of the Greek, in which θεος, Αθηναια, take the forms σιος, Ασαναια. Hence too τυπτομεσθα, &c., readily glided into τυπτομιθα, &c. The English language formerly wrote *loveth*, *hateth*, but now prefers *loves*, *hates*.

3. *S* with *t*. The Attic forms φησι, Ποσειδων, συ, were by the Dorians written φατι, Ποτειδαν, τυ. In like manner the German words *das*, *was*, *es*, *wasser*, appear in English as *that*, *what*, *it*, *water*.

4. *S* with *z*. The Greek island Ζακυνθος was the mother city of Saguntum in Spain, and no doubt gave its name to it. But the most abundant evidence of the interchange is to be found in the Somersetshire dialect of our own tongue.

5. *S* with *sh*. The English words *sleep*, *slay*, *smear*, *snow*, have for their German equivalents *schlaf*, *schlag-en*, *schmier-en*, *schnee*.

6. *S* with *c*, *g*, and *h*. [See those letters.]

7. *Ks* with *g*. [See X.]

8. *S* with *n*. [See N.]

9. *S* with R. [See R.]

10. *S* often appears before an initial consonant, where it is doubtful whether the older form be that with or that without the sibilant. Thus the Greek στιγω, σφενδονη, σφηξ, correspond to the Latin *tego*, *funda*, *vespa*. Again the Greek has the double forms σμικρος and μικρος, στρεφω and τρεπω. The English language contains numerous examples of the same variation, as in *melt* and *smelt*, *tumble* and *stumble*, *pike* and *spike*. The German as well as our own tongue not unfrequently prefixes an *s* when the Greek and often the Latin are without that letter. Thus the Greek κλει-ω (root κλεις or κλειδ), the Latin *claud-o* or *clud-o*, and *clavis*, the German *schliess-en*, and the English *shut* are all of one kin. Compare too the various forms of the words signifying *snow*.

11. The sound *sw* at the beginning of words is often degraded by the loss of the sibilant or *w*, or both. Thus to the Latin *suavis* and *suadeo* correspond the Greek ἁδυς, &c., the German *süss*, and the English *sweet*. Again *sop-or* and *somnus* (*sop-nus*) of the Latin correspond to the Greek ὑπ-νος, to the Gothic verb *in-suepp-an*, the German *schlaf*, and the English *sleep*; *socer* and *socrus* in Latin, to the Greek ἑκυρος and ἑκυρα, and to the German *schwieger* as prefixed to *sohn*, *vater*, &c.; the Latin *sud-or*, to the Greek ἱδ-ος, ἱδρως, &c., to the German *schweiss*, and English *sweat*; the Latin *sui*, *sibi*, *se*, to the Greek οὑ, οἱ, ἑ, although the Greek has also allied words beginning with σφ. The Latin *soror*, German *schwester*, English *sister*, have lost their correlative in Greek.

12. *Sp* is interchangeable with *ps*, *sk* with *ks*, and *sd* with *ds*. For the last we need only refer to the Doric use of σδ for ζ. Instances of the second interchange occur occasionally in Greek and Latin. Ἱξος, the mistletoe, is written in Latin *viscus*; ισχατος, ludicrously put down as a primitive in some lexicons, is the superlative of the preposition ἐξ, for ἐξατος. The Latin *misceo* has for its participle *mixtus* as well as *mistus* (=*misctus*). But the Anglo-Saxon and English afford the most numerous instances of this metathesis. Thus the former language has the double forms of *väps* or *vasp*, a wasp; *äpse* or *äspe*, tremulous (whence the name of the *aspen* tree); *häpse* or *häspe*, a lock (Grimm, 'Deutsche Grammatik,' p. 251); also *frosc* or *frox*, a frog; *fiscas*, or *fixas*, a fish; *tusc* or *tux*, a tusk; *asce* or *axe*, cinder; *ascjan* or *axjan*, to ask (*ibid.*, p. 256). It is a mere accident if in our own tongue *axe* and *waps* have been rejected as vulgarisms in favour of *ask* and *wasp*. The provinces still prefer the *ks* and *ps*.

13. *S* is often lost. Inattention to this fact is the cause of much confusion in the grammars of the Greek language. Thus the neuter nouns in ος must once have had a corresponding σ in the genitive, γενες, γενεσος, &c., afterwards γενος, γενεος. The Latin language often discards an *s*, particularly at the end of words, as in the double forms *magis* and *mage*, *videris* and *videre*, *ipsus* and *ipse*, *puer* for *puerus*. Nay, even the neuters of adjectives seem to have lost the final *s* of the nominative in this way. At any rate *potis* is used for a neuter nominative as well as *pote*. The French language abounds in examples of the loss of the sibilant. Thus from the Latin *asinus*, *magister*, *noster*, *quadragesima*, are derived, first, *asne*, *maistre*, *nostre*, *caresme*, and then, according to the modern orthography, *âne*, *maître*, *notre*, *carême*, to say nothing of the silent *s* in such words as *mais*, *vous*, *isle*, *est*, &c.

SAAD-ED-DEEN (*Khoja Saad-ed-Deen Mohammed Effendi*), the most celebrated of the Turkish historiographers, was born in the early part of the 16th century of our æra. His father, Hassan-Jan, a Persian by birth, held a post in the household of Sultan Selim I. He received his

education among the pages of the imperial palace, and became a muderris, or professor in the college attached to the great mosque of St. Sophia. He was next appointed by Selim II., in 1573, khoja, or preceptor, to his son Mourad, and when Mourad came to the throne, he was nominated cad hilesker, or military judge, but he continued to retain almost unlimited influence over his imperial pupil. On the death of the Mufti Bostan-Zadah, March, 1598, Saad-ed-Deen was raised to the highest ecclesiastical dignity by the sultan. He did not however long survive his exaltation, dying suddenly, Oct. 2, 1599 (A.H. 1008). The great historical work of Saad-ed-Deen, composed by order of Mourad III., is entitled 'Tadj-al-Towarikh,' or the crown of histories, and gives a full and copious narrative of the history of the empire, from its foundation in 1299 by Othman, to the death of Selim I. in 1520. This valuable work has never yet been printed, but MS. copies are frequent in European libraries, and an Italian version was published by the Ragusan Vincenzo Bratutti (4to., part i., Vienna, 1646; part ii., Madrid, 1652), under the title 'Cronaca dell' Origine e Progressi degli Ottomani, composta da Saidino Turco, e tradotta in Italiano.' A Turkish abridgment of the work, with a continuation, was published in 1696 (A.H. 1108). Besides this great work, Saad-ed-Deen was the author of the 'Selim-Nameh,' a history of Selim I.

SAADI, or (as his name is written in full in Arabic or Persian) *Sheikh Moslih Eddin Saadi Alshirazi*, was born A.H. 571 (A.D. 1175-6) at Shiraz, in Persia. Saadi led the life of a dervish, or wandering monk, and passed most of his early years in travelling from one country to another. In the course of these journeys he was taken by the Crusaders, and put to labour on the fortifications of Tripoli. He was redeemed from this slavery by a rich merchant, who gave him his daughter in marriage, with a dowry of a hundred pieces of gold. Saadi died in 1291; so that, if the dates of his birth and death are correct, he reached the extraordinary age of 116 years.

The works of Saadi, collected by Ahmed Nasik Ben Sesán, consist of the Gulistan, Bostan, Gazels (or odes), Kasaid (or elegies), Mokataat (fragments), Rubayat (quatrains), and essays of various kinds in prose. Of all these the best known are the Gulistan and the Bostan. Of the Gulistan there have been many translations. The whole works of Saadi, in the original Persian and Arabic, were printed at Calcutta, in 2 vols. small folio, edited by Harrington (1791).

SAALFELD, the capital of a former principality now merged in SAXE-MEININGEN, is situated on the Saale, in a fertile country, and has 4500 inhabitants, who manufacture woollen-cloth, leather, tobacco, chicory, beer, and vinegar. The town has four churches, a gymnasium, and two ducal palaces, one of which contains a mint.

SAARBRUCK. [TRIER.]

SAARLOUIS. [TRIER.]

SAATZ. [BOHEMIA.]

SAAVEDRA, MIGUEL DE CERVANTES, was born at Alcalá de Henares, Oct. 9, 1547, of an ancient family. Very little is known of his early life, except that he received his first education at the place of his birth, and gave early proofs of talent. He went afterwards to the University of Salamanca, and also studied at Madrid under the tuition of Juan Lopez de Hoyos. In 1568 Cervantes entered the household of Cardinal Aquaviva, and accompanied that prelate on his return to Rome. He remained with him one year, after which he entered the army, and distinguished himself as a volunteer under Marco Antonio Colonna, the commander of the papal forces against the Turks; and subsequently under Don Juan of Austria, and his successor in command, the Marquis of Santa Cruz. Having early in 1576 obtained a command in a regiment about to be sent to the Low Countries, Cervantes embarked with his elder brother Rodrigo, also a soldier, on board a Spanish galley, which was taken by an Algerine squadron, on Sept. 26, 1576, and carried into Algiers. The crew and passengers were sold as slaves. Cervantes, who had fought with desperation on the boarding of the galley, was reserved by the commander for himself.

The numerous interesting details which Cervantes has given us in his novel 'El Cautivo' (the Captive) cannot be read without calling forth our admiration. After many unsuccessful attempts to regain his liberty, Cervantes was redeemed in 1580 by the Fathers of Mercy, established for that purpose at Algiers, who paid to Hassan Aga, then his master, the enormous sum of 500 gold ducats. On his return to his native country, Cervantes, being destitute of all resources, again resumed the military profession, and served in three successive expeditions against the Azores. It was not till his return to Spain, in 1584, that he appeared as an author, having soon after published his 'Galatea,' a pastoral romance in prose and verse, in imitation of 'La Diana' of Montemayor. He next devoted all his attention to the composition of dramas, of which he wrote upwards of thirty, and which he informs us were all acted with considerable applause. These are however all lost with the exception of two, 'El Trato de Argel' (The Trade of Algiers), and 'La Numancia.' In 1588 we find Cervantes at Seville, where he filled the office of assistant-purveyor to the Indian fleets. From 1598, when he left Seville, to 1602, when we hear of him at Valladolid, there is a gap in his history. Three years afterwards he published the first part of his 'Don Quixote.' No less than four editions of it were printed in various parts of the Peninsula within the first year after its appearance. But notwithstanding the enthusiastic reception of his work, Cervantes continued poor, and he was engaged to write an account of the festivities with which Lord Howard, ambassador of James I., was received at Valladolid in 1605. On the return of the court to Madrid in 1606, Cervantes followed it, and he continued to live in that city to the end of his life. In 1608 he brought out a correct edition of the first part of 'Don Quixote,' and in 1613 his 'Novelas Exemplares' (Exemplary Tales). In 1614 he published his 'Viage al Parnaso' (Journey to Parnassus). This work

being intended as a satire upon the bad poets of his time, some took offence at it, and one, among others, published, under the assumed name of Alonso Fernandez de Avellaneda, a continuation of 'Don Quixote,' full of invective and abuse (Tarragona, 1614). This probably hastened the publication of the second part, which was sent to press early in 1615, with a dedication to his patron the Conde de Lemos. His other works are a collection of Comedies and Entremeses (interludes) written in the fashion of the new school introduced by Lope de Vega, but which were never acted (Mad., 1615, 4to.); and a novel entitled 'Persiles y Sigismunda' (Madrid and Barcelona, 1617).

Cervantes died at Madrid on the same day as his great contemporary Shakspere, April 23, 1616.

The works of Cervantes have been too often analysed to render it necessary here to dwell upon their merits. His life has been written at great length by some of the most eminent Spanish authors. 'Don Quixote,' within a few years of its publication, was translated into almost every European language. By far the best English translation, as coming closer to the original than any other, is that of Jarvis, which has often been reprinted.

SABA. [Antilles; West Indies.]

SABADILLA. [Cevadilla; Veratrum.]

SABADILLINA, an alkali contained in the different kinds of hellebore. It is obtained in the form of reddish stellated hexagonal prisms; but when quite pure it is colourless. Its taste is extremely acrid. At 392° it fuses into a resinous mass; at a high temperature it is decomposed.

SABAEI (Σαβαῖοι), a people of Arabia Felix, on the borders of the Red Sea, in the northern part of the modern Yemen. The country is mentioned in the Old Testament under the name of Sheba, and is spoken of as rich in incense, spices, precious stones, and gold (1 Kings, x. 2; Jer., vi. 20; Is., lx. 6; Ps., lxxii. 15), and as carrying on an extensive commerce with the other nations of Asia (Ezek., xxvii. 22; Job, vi. 19; Joel, iii. 8). The Queen of Sheba who visited Solomon (1 Kings, x. 1) is generally allowed to have come from this country, and not from Ethiopia, as Josephus relates ('Antiq. Jud.,' viii. 6, sec. 5).

The capital of the Sabaei is called Saba by the Arabic writers, according to whom the founder of the city made in its immediate neighbourhood a vast mound or dam, to serve as a reservoir to receive the water which came from the mountains. This dam broke down, and the water carried away the whole city with the neighbouring towns and people, in the third century before the Christian æra; but if such were the case, it would appear, from an account given by Strabo, that the Sabæans had again recovered a large portion of their former prosperity.

SABAISM was the name given to a religious system which anciently prevailed to a great extent in Arabia and Mesopotamia. Sabaism is frequently confounded with the Sabaei, and is sometimes described as the religion of the latter people; but the two words are quite distinct, and are written differently in the Semitic languages. Sabaism would be written more correctly Tsabaism.

Tsabaism was derived, according to its followers, from Tsabi, the son or brother of Enoch, but is more probably derived from their worshipping the 'Host of Heaven.' According to the Arabic writers, Tsabaism was the same as the religion of the ancient Chaldæans, and appears to have been one of the earliest and simplest forms of idolatry. Tsabaism as a religious system no longer exists, but the name has been frequently, but incorrectly, applied to the Mandaites, or Christians of St. John, as they have been called.

SABATI'NI, FRANCISCO, was born at Palermo in 1722. He studied architecture at Rome, and at Naples was employed as the second overseer of the works at the palace of Caserta, under his father-in-law, Luigi Vanvitelli. While thus employed, the King of Naples bestowed upon him a commission of lieutenant in the artillery, and charged him with the erection of the cavalry barracks near the Ponte della Maddalena, and the arsenal armoury. When the King of Naples succeeded to the throne of Spain as Charles III., in 1759, Sabatini removed to Madrid, where, besides being extensively employed in his profession, he rose to considerable military rank, being made lieutenant-general in 1790, and inspector-general of engineers in 1792. Among his chief works in the capital are the Aduana, or Custom-House, the gate of Alcalá (a magnificent façade, with three lofty arches and two other entrances, making in all five openings through both fronts), the gate of San Vincente, and the royal porcelain manufactory at Buen Retiro. He died at Madrid, Dec. 19, 1798.

SABBATH. The narrative in the Book of Genesis of the creation of the world in six days is followed by these words: 'And on the seventh day God ended his work which he had made; and he rested on the seventh day from all his work which he had made. And God blessed the seventh day, and sanctified it; because that in it he had rested from all his work which God created and made.' (Gen., ii. 2, 3.) These words seem to imply that the seventh day is to be observed by all the rational creatures of God as a day of worship in acknowledgment of their Creator, and as a day of rest in imitation of his rest after the creation. The general spirit of the Jewish law concerning the Sabbath may be gathered from the following words of Isaiah (chap. lviii. 13):—'If thou turn away thy foot from the Sabbath, from doing thy pleasure on my holy day; and call the Sabbath a delight, the holy of the Lord, honourable; and shalt honour him, not doing thine own ways, nor finding thine own pleasure, nor speaking thine own words:' then follows a promise. The Sabbath was reckoned, like the Jewish day in general, from sunset to sunset.

The word Sabbath was also used by the Jews as a general name for their religious festivals, and also as equivalent to the word week. (Levit., xxiii. 15; Deut., xvi. 9; Matt., xxviii. 1; Luke, xviii. 12.)

The first teachers of Christianity abolished the Sabbath, but introduced a similar institution in its place, the observance, namely, of the *first* day of the week as a day of rest and of religious worship, in commemoration of God's resting on the seventh day, and also more especially of the resurrection of Christ. Hence it was called 'the Lord's Day,' just as the ordinance by which Christ's death was commemorated was called 'the Lord's Supper.' It has been held by many eminent divines, that there is not sufficient evidence in the New Testament for such an institution; that the change of the day from the seventh to the first day of the week is an insuperable difficulty; that the Sabbath was a purely Jewish institution, and therefore that it is not binding upon Christians. The chief difficulties in this discussion appear to have arisen from a mistaken view of the question; as if it were, not whether the Christian church possesses *any* Sabbatical institution; but whether the *Jewish Sabbath* is binding upon Christians. There is no direct command in the New Testament thus to set apart the first day of the week. But, on more than one occasion, Christ, in arguing with the Jews upon the mode of observing the Sabbath, solemnly claimed for himself the prerogative of being Lord of the Sabbath-Day (Matt., xii. 8; Mark, ii. 28; Luke, vi. 5, xiii. 5; John, v. 8, 9), which seems to imply that he designed the Sabbath, modified in some way, to form a part of his religion. In examining the Fathers on this subject, it is necessary to remember that the Christian festival is always called by them the Lord's Day, and not the Sabbath: where the latter word is used, it refers to the Jewish Sabbath.

The Sabbath is used in the New Testament as a type of the eternal rest of heaven: 'There remaineth therefore a rest (or sabbath-keeping) to the people of God.' (Heb., iv. 9.) Some understand this passage of the Christian Sabbath.

SABBA'TIA, a genus of North American plants, belonging to the natural order *Gentianaceæ*. There are several species of *Sabbatia*, all of which are characterised by the possession of a pure bitter principle, and on this account they are extensively used, in North America, in intermittent and remittent fevers, and as tonics. The species most commonly used is the *S. angularis*.

SABELLIANS, an heretical Christian sect, which arose about the middle of the third century. They were the followers of Sabellius, an African bishop or presbyter, who resided in the Pentápolis of Cyrenaica. They held that there was only one person in the Godhead, namely, the Father; that Christ was a mere man, but that there resided in him a certain energy proceeding from God, or a portion of the divine nature; and they likewise deemed the Holy Spirit merely a divine energy, or an emanation proceeding from God. They were opposed by Dionysius of Alexandria, but continued for a long time to be an important sect.

SA'BIA, a genus of plants named by Mr. Colebrook from the Indian name, *Sabja*, of one of the species. The species form ornamental climbing-shrubs, with smooth lanceolate alternate leaves, suited to the shrubberies of this country.

SABI'NEA, a genus of plants belonging to the natural order *Leguminosæ*. The species are unarmed West Indian shrubs. *S. Florida* is native of the American Islands of St. John, Krabben Island, and St. Thomas. The violet flowers are considered poisonous. *S. dubia* is native of Martinique and Porto Rico.

SABINES. [ROMULUS.]

SABINIA'NUS of Volterra was elected Bishop of Rome after the death of Gregory I., or the Great, A.D. 604. Sabinianus died A.D. 605, and was succeeded by Boniface III., the first Bishop of Rome who was acknowledged by the imperial court of Constantinople as primate of the whole church.

SABI'NUS, AULUS, a Roman poet, a contemporary and friend of Ovid, whom he imitated in that species of poetry of which Ovid has left specimens in his 'Heroides.' There are extant three Heroides of Sabinus—Ulysses to Penelope, Demophoon to Phyllis, and Paris to Oenone. They are in every respect inferior to the corresponding epistles of Ovid. The poems of Sabinus are generally printed at the end of the works of Ovid.

SABI'NUS, MASSU'RIUS, a Roman jurist, a pupil of Ateius Capito, and the contemporary of Cocceius Nerva. He lived under Tiberius. Massurius Sabinus gave the name of Sabiniani to the school which was opposed to that of the Proculiani. Sabinus had a great reputation. His chief work was 'Libri III. Juris Civilis,' from which there is no direct excerpt in the 'Digest,' though there are various fragments in Gellius.

SABINUS, CÆLIUS, M., a Roman jurist, and the successor of Cassius Longinus. He was made Consul Designatus by Otho (Tacit. 'Hist.' i. 77); and his consulship belongs to the year A.D. 69, in which Otho died and Vitellius became emperor. He belongs chiefly to the time of Vespasian. He wrote a work, 'Ad Edictum Ædilium Curulium,' which is cited by other jurists (Gaius, 'Dig.' 20, tit. 1, s. 20): but there is no excerpt from Cælius Sabinus in the 'Digest.'

SACBUT (*Saquebute*, Fr.), the name formerly given in England to the TROMBONE.

SACCHARIC ACID, or OXALHYDRIC ACID, is formed by the action of dilute nitric acid on common or on grape sugar. When the solution is much evaporated, it deposits crystals after long standing.

SACCHAROMETER, an instrument used principally in the operations of brewing and making sugar. It serves to indicate the density of the liquid extracted from malt, or the degrees to which the juice expressed from the sugar-cane is concentrated previously to undergoing the process of crystallization. It is formed on the same principle as the hydrometer.

The saccharometer which is most commonly employed is made of copper, and differs in form from the hydrometer in common use only in its stem, which is six inches long, having four equal faces, each less than a quarter of an inch in breadth. Three of these faces are graduated, and the volume and weight of the whole are such that when the instrument is immersed in water it sinks till the top of the stem is but little above

the surface. The line at which the surface of the water cuts the stem is marked as the zero of the scale; and the graduations are such that, when the instrument is immersed and floats upright in a vessel containing the saccharine matter, the number of the division at the surface expresses the density of the liquid by the number of pounds avoirdupois which ought to be added to the weight of a barrel of water, in order to show the weight of an equal volume of the liquid.

For the general purpose of determining the specific gravity of fluids, on the principle of the hydrometer and saccharometer, the best instrument is one which consists of a glass cylinder about seven inches long and three quarters of an inch in diameter. It has at its lower extremity a stirrup, carrying a small cup in the form of an inverted cone, and its opposite part is drawn out so as to form a slender stem or tube, which is terminated at the upper extremity by a small cup. About the middle of the stem a mark is made, and, in order that the instrument may be enabled to float vertically in a vessel containing the liquid whose specific gravity is to be determined, a constant weight, which may be a ball of glass containing mercury, is placed in the lower cup.

To find the specific gravity of the liquid, let W be the whole weight of the instrument, including the constant weight in the lower cup, and let w be a weight which, when put in the upper cup, will cause the instrument to sink in the liquid till the above-mentioned mark on the stem comes to the level of the surface; also let w' be the weight which will cause the instrument to sink in distilled water till the same mark comes to the surface. Then, since the volumes of the immersed part of the instrument are the same, and the weights of the instrument, including the ball, in the lower, and the additional weights in the upper cup, are equal to the weights of the fluid displaced, those weights are to one another in the same ratio as the specific gravities of water and of the liquid. Therefore $\frac{W + w}{W + w'}$ expresses the specific gravity of the liquid, that of water being unity.

SA'CCHARUM, the name of a genus of plants of the natural family of *Gramineæ*, and also of that of the well-known product Sugar. It contains numerous species, which are usually easily distinguished by their highly ornamental nature, by the light and feathery or rather silk-like inflorescence. The species are widely distributed through the tropical parts of the world.

S. officinarum, the best known species, or that yielding sugar in India, is cultivated in all parts of that country, and several varieties are known. It was introduced into the South of Europe and the Canaries, and thence into the West Indies. Another species, introduced from China, was named *S. Sinense* by Dr. Roxburgh. It was extensively distributed throughout India, and still is so to some extent, as the canes are large, rich in juice, and hard enough to resist the attacks of the white ants.

Some of the species of *Saccharum*, owing to the silex in their cuticle, are so durable that they are employed in India for thatching, such as *S. canaliculatum* and *S. cylindricum*. The natives of Bengal make their pens of the hollow stems of *S. semidecumbens* and of *S. fuscum*.

SACCHETTI, FRANCO. The precise date of his birth is not known, but Bottari has fixed it about 1335. His father was Benci di Uguccione, of the Sacchetti family, one of the most considerable in Florence. He appears to have received an education of a superior kind, and to have been well versed not only in polite literature, but in severer studies. In 1383 he filled the office of one of the magistrates Degli Otto, or Council of Eight, at Florence; and two years afterwards was chosen, much against his inclination, as ambassador from the republic to Genoa, but he escaped that honour by happening at the same time to be elected Podestà, or chief magistrate, of Bibbiena. He afterwards held the same office, first at San Miniato, and, in 1396, at Faenza. The time of his death is as much a matter of uncertainty as that of his birth. Crescimbeni makes him live till after 1410, while Bottari conjectures that he must have died shortly after the beginning of the century.

Although his sonnets, canzoni, capitoli, and other metrical compositions obtained for him great repute as a poet among his contemporaries and his countrymen, it is chiefly by his 'Novelle' that Sacchetti is now known as a writer. The collection originally consisted of three hundred tales, but of that number only two hundred and fifty-five now remain. Bottari mentions a comic poem in MS. entitled 'La Battaglia delle Vecchie colle Fanciulle,' which was published at Bologna in 1819.

SACCHETTI, GIAMBATTISTA, was born at Turin, where he studied architecture under Juvara, who recommended him as his successor for carrying into execution the designs for the new palace at Madrid. He was accordingly summoned to that capital by Philip V. in 1736. Juvara's design however was found to be too large for the intended site, and was laid aside altogether, and his successor had then to prepare an entirely new one, in which the plan was greatly curtailed, being reduced to a square of 470 feet. Even thus abridged, the present edifice (begun in April, 1737) is a vast pile, and one of unusual loftiness. This important work left Sacchetti little leisure for anything else except completing the façade of the palace of St. Ildefonso as designed by Juvara. He was also director of the public school of architecture at Madrid; and on the Academy of St. Ferdinand being established, 1752, he received the honorary title of director. He died Dec. 3, 1764.

SACCHI, ANDREA, was the natural son of Benedetto Sacchi, an obscure painter, and was born in the vicinity of Rome, 1599. His father, perceiving the ability of his son, placed him at an early age in the studio of Albano, whom he soon surpassed. Upon the accession of Urban VIII. in 1623, he was appointed to execute one of the great altar-pieces of St. Peter's; and he painted a large picture for the altar of Gregory the Great, representing the performance of a miracle by that saint. He painted many works for the Cardinal Barberini, who granted him a pension for life.

St. Romualdo relating his vision to five monks of his order, is considered Sacchi's masterpiece, and, notwithstanding its remarkable simplicity both of composition and colour, has been generally pronounced to be one of the four finest works in Rome. This picture was carried away by the French, but it is now in the museum of the Vatican; it has been excellently engraved by Frey. There are several other fine works by him extant, though he painted but little.

Sacchi's manner of execution was very broad, and his colouring subdued and perfectly harmonious. He is considered, after Raphael, the best colourist of the Roman school. His design was pure and grand, and his composition equally natural and simple.

SACCHULMIC ACID and SACCHULMIN are obtained by treating cane-sugar with sulphuric acid. Sacchulmic acid appears in brown flocculi, which when dry become a light brown powder: it consists of C^2 H^2 O^1. Sacchulmin is deposited in the form of brown brilliant crystalline scales.

SACCOLA'BIUM, a genus of plants of the tribe *Vandeæ* and natural family of *Orchideæ*, now extensively cultivated in hothouses especially dedicated to their cultivation.

SACHEVERELL, HENRY, D.D., was born about 1672. He was entered at Magdalen College, Oxford, and became a fellow of it. He took his degree of M.A. in 1696, of B.D. in 1707, and of D.D. in 1708. In 1705 he was appointed preacher of St. Saviour's, Southwark; and it was while in this situation that he delivered his two famous sermons, the first at the assizes at Derby, Aug. 15, 1709, the second before the lord mayor at St. Paul's, Nov. 5, in the same year. These discourses, having been printed, were both in December following brought under the notice of the House of Commons, which passed a resolution denouncing them as 'malicious, scandalous, and seditious libels.' The author and printer were at the same time ordered to attend at the bar of the House, and it was resolved that Sacheverell should be impeached of high crimes and misdemeanors. It is asserted by Swift and other authorities that Sacheverell's real offence, in the eye of the Whig ministry of the day, was his having in one of his two discourses pointed, as was conceived, at the lord treasurer Godolphin, in a passage about 'the crafty insidiousness of such wiley Volpones.' Volpone seems to have been before this a popular nickname of Godolphin. The trial commenced before the House of Lords in Westminster Hall, Feb. 27, 1710, and lasted till March 20, on which day a majority of their lordships (69 to 52) pronounced Sacheverell guilty; and three days after, sentence was passed, adjudging him not to preach for three years ensuing, and ordering his two sermons to be burnt by the common hangman. The populace celebrated this impotent conclusion of the affair with bonfires and other rejoicings; and when, in May following, he set out to take possession of a living in Shropshire, to which he had been presented, his journey was a continued triumph. There is no doubt that this affair mainly contributed to the overthrow of the Whigs in the autumn of the same year. On the expiration of his sentence, in March, 1713, Sacheverell preached at St. Saviour's church, on the Christian triumph, or the duty of praying for our enemies, and again published his discourse. Within a month after the removal of his suspension, the queen presented him to the valuable rectory of St. Andrew, Holborn. He never appeared again as an author, except in a dedication prefixed to a volume of posthumous sermons by the Rev. W. Adams, published in 1716. He was suspected of being concerned in the alleged plot of Bishop Atterbury, who is believed to have written the defence which Sacheverell delivered on his impeachment. He died June 5, 1724.

SACHS, HANS, whose real name is said to have been Loutzdorffer, was born Nov. 5, 1494, at Nürnberg, where his father was a tailor, and after studying at the Latin schools, he was instructed in the business of a shoemaker.

About two years after he entered his apprenticeship, that is, about the age of seventeen, Hans became the disciple of Leonard Nunnenbeck, a weaver by trade, but also a meistersinger, who initiated him into the mystery of making verses. As soon as his apprenticeship expired, he travelled over a great part of Germany, and then returned and settled at Nürnberg, where he was twice married. After some years, his eyesight and hearing failing, he withdrew from society, and shut himself up with his books; his natural serenity and cheerfulness of temper however were not disturbed by these misfortunes, and he tranquilly reached his 87th year, dying Jan. 25, 1578.

Hans Sachs was one of the most prolific writers Germany has ever produced. His works amount altogether to upwards of six thousand different compositions, of which only a portion are contained in the five folio volumes of his pieces printed at Nürnberg, 1576–79. By posterity they are known only as recorded literary phenomena; they preserve little more than a name in the annals of poetry. [GERMANY, *Literature.*]

SACHTLEVEN (or ZACHTLEVEN), CORNELIUS, was born at Rotterdam, in 1606. He settled at Antwerp, and gained great reputation by painting subjects from low life in imitation of Brauwer. He painted also the interiors of farmhouses, and the sports and recreations of the villagers, in the style and manner of D. Teniers. Though inferior to these great artists, his works have considerable merit.

SACHTLEVEN, HERMAN, was born at Rotterdam in 1609, studied under John van Goyen, and became a landscape painter. The scenery of the Netherlands not being suitable to his taste, he visited the countries on the banks of the Rhine and the Meuse, which afforded him more picturesque subjects. His pictures are highly finished, with a light free touch, and a skilful management of the aërial perspective. He died in 1685.

SACK, a Spanish wine of the dry kind; in French, *Vin sec.* It is called *seck* in an article, cited by Bishop Percy, from an old account-book of the city of Worcester: 'Anno Eliz. xxxiiij°. Item, for a gallon of claret wine and *seck*, and a

pound of sugar.' Other instances have been found. See the various notes on the two parts of Shakspere's 'Henry IV.' Opinions differ on the subject; but there seems to be no reasonable doubt of its being the same wine which is now named Sherry.

SACKVILLE, THOMAS, EARL OF DORSET, was born in 1536, at Buckhurst in Sussex. He was the only son of Sir Richard Sackville, the representative of a very ancient family. After studying both at Oxford and Cambridge, and taking the degree of M.A. in the latter university, he removed to the Inner Temple, and was called to the bar. Shortly afterwards he was elected a member of the House of Commons. His youth, though passed in dissipation and extravagance, was not wholly misspent, as is shown by his poems. At the time of his father's death, in 1566, he returned from the Continent, which he had visited after his marriage. In the same year he was created Lord Buckhurst, by Elizabeth, and having on a sudden reformed his habits of profuseness, received from that time various marks of royal favour. In 1570 he was sent on an embassy to France; and in 1587 was employed as ambassador extraordinary to the United States of the Netherlands, to adjust the differences between them and the Earl of Leicester, whose anger he drew upon himself in the discharge of this duty, and was in consequence imprisoned till the death of Leicester, when, in 1588, he was at once restored to Elizabeth's confidence, and filled a variety of state offices. In 1598, on the death of Burghley, he was made lord treasurer, which situation he held during the next reign till his death, April 19, 1608. His letters, many of which are preserved in the Cotton Collection in the British Museum, show that he was distinguished by the qualities which befit a statesman, and confirm the judgment of his contemporaries.

His poems are—the tragedy of 'Ferrex and Porrex,' called in a later edition 'Gorboduc;' 'The Induction,' or poetical preface to 'The Mirror for Magistrates;' together with 'The Complaint of the Duke of Buckingham,' in the same collection.

SACKVILLE, CHARLES, EARL OF DORSET, was born Jan. 24, 1637. In his youth he travelled into Italy, and returned a little before the Restoration; he afterwards sat in parliament for the borough of East Grinstead in Sussex, and became a favourite with Charles II. In 1665, being then Lord Buckhurst, he attended the Duke of York as a volunteer in the Dutch war; and on the eve of the battle in which the enemy were defeated, he is said to have composed the song beginning 'To all ye Ladies now on Land.' He was employed after this in short embassies to France. He became Earl of Dorset by the death of his father in 1677.

Dorset was favourably noticed by James II., but ceased to be one of his adherents as he grew more violent in his measures. At the accession of William III. he was appointed lord-chamberlain of the household, and received other marks of royal favour. He died at Bath, Jan. 19, 1705-6. Something of the ease and sprightliness of his conversation has been transmitted to us through his poems, though there is little to justify the extravagant praises of Dryden and others.

SACKVILLE, LORD GEORGE, a younger son of the Duke of Dorset, was born Jan. 26, 1716. During the reign of George II. he was employed both as a statesman and a soldier; he served at Dettingen and Fontenoy; and at the battle of Minden, fought in 1759, he commanded the British forces under Prince Ferdinand of Brunswick. Having failed to execute the prince's orders to charge, by which default the victory was rendered less decisive than it might have been, he was insulted by his commander, and, at his own request, recalled to England, where he demanded a court-martial, by which, April 3, 1760, he was adjudged incapable of serving thereafter in any military capacity. George II., who was highly incensed at Sackville's conduct, took every means of rendering his punishment most galling. In the reign of George III., he returned to public life; and having attached himself to Lord North, was made secretary of state for the colonies in 1775 and had the direction of the American war. In 1782 he, with his leader, retired from office, having been raised to the peerage by the titles of Viscount Sackville and Baron of Bolebrook, titles united to the dukedom of Dorset by the accession of Lord George's eldest son to that dignity. In 1770 Lord George Sackville took the name of Germain in consequence of a bequest. He died August 26, 1785.

SACRAMENTS and TRANSUBSTANTIATION. With regard to the number of the Sacraments, as is well known, two opinions are current among Christian communities—the Greek and Romish churches holding the number of seven, while all other Catholic bodies limit the number to two. The Seven Sacraments are—Baptism, or the sign of our spiritual birth; the Eucharist, in which our spiritual life is nourished; Confirmation, for the strengthening of the same; Penance, for the restoration of the lapsed; Extreme Unction, as a preparation for death; Matrimony, for maintenance of the race of mankind in general; and Orders, for the maintenance of the race of God's ministers. The two sacraments to which, in the judgment of all Catholic bodies (save the Greek and Romish communions) the number is properly limited, are those of Baptism and the Lord's Supper. The principal feature of the scheme of salvation providentially offered to man is faith in the Saviour; that is, that through Christ a path is opened to heaven. The symbols of this faith, and the acts by which an obligation to it is expressed, are the two Christian sacraments, Baptism and the Lord's Supper.

With regard to the effects produced by Baptism, no dogmas, save those of Grace and Justification, have perhaps been so productive of disputes as this of Baptismal Regeneration and the kindred subject of Infant Baptism. The opinions held by the Church of England, that of Rome, and the Lutheran, do not differ in material particulars; while those of other religious denominations will be found to vary (in a like measure with their

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leading principles) from what is usually known as the Catholic doctrine.

The various opinions respecting the exact import and appropriate benefits of the Lord's Supper are of high antiquity. John of Damascus, the principal writer of the Eastern Church, maintained, on the authority of some of the Fathers, a literal change of the bread and wine into the body and blood of Christ. The figurative interpretation put upon the words of Christ by a council at Constantinople in 754 was denied at the second council of Nice in 787, when it was ruled that the sacred symbols are not figures or images at all, but the real body and blood. Theophylact and Euthymius Zigabenus coincide with John of Damascus. But it was reserved for the Western Church to carry out into its remote consequences the doctrine of a material change, which, in common with her Eastern sister, she ultimately came to maintain. Great discrepancy of expression on this subject may be found in the writings of Western theologians anterior to the time of Charlemagne; the utmost however that can be fairly drawn from them is, that the sacramental elements were not to be regarded as purely symbolical. But it is undeniable that a strong tendency to transubstantiation (as it was afterwards termed) is throughout discernible. This doctrine was maintained during the ninth century by Paschasius Radbert more precisely and authoritatively than before. During the eleventh century it had become an article, to dissent from which was heretical. Finally, the doctrine was established as matter of faith at the Lateran Council held in 1215. Even Occam assented to its truth, and it was subsequently ratified at the council of Trent.

Among the numerous controversies connected with the different theories on the subject, the more modern opinions are marked by a tendency to regard the Eucharist as a purely symbolical rite. For Transubstantiation Luther substituted (probably through the effect of Occam's writings) a corporal local presence, commonly called Consubstantiation. [CONSUBSTANTIATION.] Luther's object was to preserve this sacrament from being degraded by the same unspiritual subjective views (as he conceived) with which it was menaced by Carlstadt and his party.

The point of divergence between the adherents of Luther and Calvin respecting the Eucharist may be stated thus:—The former party held, according to the earlier Augsburg Confession and the Form of Concord, that the body of Christ was contained in, with, and under, the sacramental bread. The others held the doctrine only of a real spiritual feeding on the body of Christ, which took place in the faithful contemporaneously with the reception of the outward elements.

The late Bishop Lloyd considered that the Anglican doctrine was borrowed from that of Calvin. But the words of Waterland may be fairly quoted as expressing briefly the opinion held by the majority of Anglican teachers on this subject. 'The sum of all is, that sacramental or symbolical feeding in the eucharist is feeding upon the body broken and the blood shed under the signs and symbols of bread and wine; the result of such feeding is the strengthening or perfecting our mystical union with the body glorified, and so, properly speaking, we feed upon the body as dead, and we receive it into closer union as living, and both in the eucharist when duly celebrated.'

SACRIFICE, an offering made to God, in which the thing offered is wholly or partially destroyed. It is generally supposed that sacrifices were instituted immediately after the fall of Adam, when God made with him what is called 'the covenant of grace;' and that on this occasion the sacrifice was partly an atonement for Adam's sin, partly a ratification of the covenant. All over the world sacrifices have been found in some form or other, which is another proof of their great antiquity. Their chief object is to atone for sin [ATONEMENT], but they have also been offered as the means of gaining the favour and assistance of God, and of expressing submission and gratitude to him. They may be divided into two classes, bloody and unbloody. Sacrifices form a large part of the Jewish law. Christians believe them to be abolished since the death of Christ, since, as St. Paul argues in his Epistle to the Hebrews, that was the one great sacrifice which has for ever made atonement for the sins of men.

SACRILEGE (from the Latin *Sacrilegium*) is 'the felonious taking of any goods out of any parish-church or other church or chapel.' Sacrilege was apparently the only felony at common law which deprived the offender of the privilege of sanctuary.

The law of sacrilege now depends on the statute 7 & 8 Geo. IV. c. 29, s. 10, which enacts that 'if any person shall break and enter any church or chapel, and steal therein any chattel, or having stolen any chattel in any church or chapel, shall break out of the same, every such offender, being convicted thereof, shall suffer death as a felon.' By 9 Geo. IV. c. 55, s. 10, the same protection was extended to meeting-houses and all places of divine worship.

By the 5 & 6 Wm. IV. c. 81, the punishment of death was abolished, and transportation for life or for any term not less than seven years, or imprisonment with or without hard labour for any term not exceeding four years, was substituted in its place. These penalties were again altered by 6 Wm. IV. c. 4, which limited the term of imprisonment to three years, and gave to the court a discretionary power of awarding any period of solitary confinement during such term. But now, by the statute 7 Wm. IV. and 1 Vict. c. 90, s. 5, no offender may be kept in solitary confinement for more than one month at a time, or three months in the space of one year.

SACROBOSCO, JOHANNES DE, an eminent English mathematician of the 13th century, contemporary with Roger Bacon. The place of his birth is generally supposed to have been Holywood, but is not positively known, there having been at that period at least two towns in England of that name. He died at Paris in the year 1256. His treatise 'De Sphærâ Mundi' continued to be used in the schools for nearly four centuries.

SACY, ANTOINE ISAAC SILVESTRE

DE, was born at Paris, Sept. 21, 1758. At the early age of seven De Sacy lost his father, but his mother took great care of his education. His progress in classical studies was very rapid, as appears from his intimate acquaintance both with Latin and Greek literature. Having finished his classical studies, De Sacy began the study of Hebrew. From Hebrew he proceeded to the Syriac, Chaldee, and Samaritan, and thence to Arabic and Ethiopic. With these laborious pursuits De Sacy combined the study of the Italian, Spanish, English, and German languages, with all which he made himself well acquainted. He soon added to his knowledge of Arabic that of Persian and Turkish. In 1795 a school for teaching living Oriental languages was established by the Convention, and De Sacy was appointed professor of Arabic. In 1805 he was appointed professor of Persian; and in 1810 appeared his Arabic Grammar, the result of fifteen years of labour, and his translation of Abd-al-latif's description of Egypt ('Relation de l'Egypte'), 4to., with excellent notes. Under the imperial government De Sacy received the title of baron; and Louis Philippe, in 1832, made him a peer of France. He died in February, 1838. Oriental literature is greatly indebted to this distinguished scholar, whose labours commenced in 1780, and were continued during more than half a century. A paper, giving an account of De Sacy's life and writings, was read before the Academy in June, 1838, by his friend M. Reinaud.

SADDUCEES (Σαδδουκαῖοι), one of the four Jewish sects at the time of Christ. Their origin is unknown, for little dependence can be placed on the Rabbinical tradition which makes them the followers of Zadok, a disciple of Antigonus Socho. They denied the existence of any spiritual beings except God, and believed that the soul died with the body, and therefore that there was no resurrection. (Matt., xxii. 23; Acts, xxiii. 8.) They rejected the traditions of the Pharisees, and adhered to the text of the Mosaic law. They nevertheless united with the Pharisees against Christ. During the period to which the New Testament refers, they seem to have been the stronger party in the Sanhedrim, and some of their body were high-priests, as Caiaphas and Ananias. It seems that they modified their opinions in progress of time, and received the doctrines of angelic beings and of the resurrection; so that at last they were only distinguished by their rejection of tradition.

SADLER, SIR RALPH, the eldest son of Henry Sadler, Esq., was born at Hackney in Middlesex, in 1507. In early life he gained a situation in the family of Thomas Cromwell, earl of Essex, who introduced him to the notice of Henry VIII., by whom he was employed in the dissolution of the religious houses, and he had his full share of their spoil. In 1537 he commenced a long series of diplomatic services in Scotland. Henry was so satisfied with Sadler's services that he included him, by the title of Sir Ralph Sadler, knight, among the twelve persons whom he named as a privy-council to the sixteen nobles to whom in his will he had bequeathed the care of his son and of the kingdom. At the battle of Pinkie Sir Ralph Sadler greatly distinguished himself, and was raised to the degree of knight-banneret on the field. In Queen Mary's reign, although he appears to have been in her favour, he retired to his estate at Hackney, and resigned the office of clerk of the hanaper, which had been conferred upon him by Henry VIII. On the accession of Elizabeth he was called to the privy-council. He was a member of her first parliament as one of the knights of the shire for the county of Hertford. When Elizabeth thought proper to favour the cause of the Reformation in Scotland, Sir Ralph Sadler was her principal agent. He was also concerned in the subsequent measures which led to the death of Mary, Queen of Scots, and was appointed her keeper in the castle of Tutbury, which office was so uncongenial, that, on his expostulation, Mary was committed to a new keeper. After her death, he was employed to pacify James VI., and in this, his last public employment, he completely succeeded. Sir R. Sadler died at Standon in Hertfordshire, March 30, 1587, where there is a monument to his memory.

Sir Ralph Sadler's most memorable embassies are recorded in 'Letters and Negociations of Sir Ralph Sadler,' &c., printed at Edinburgh, 1720, 8vo., from MSS. in the Advocates' Library: but a more complete collection was published of his 'State Papers and Letters,' edited by Arthur Clifford, Esq., of Tixal, his descendant, in 1809, in 2 vols. 4to., to which was added, a 'Memoir of the Life of Sir Ralph Sadler,' by Mr. (afterwards Sir) Walter Scott, with historical notes.

SAFETY LAMP. [Lamp, Safety.]

SAFFLOWER, or *Bastard Saffron*, is obtained from the *Carthamus tinctorius*. This plant has been cultivated in eastern countries from the earliest times, both on account of the oil expressed from its seeds and for the colouring matter procurable from its flowers, which in their dried state form the Safflower of commerce. The oil of the seeds of *Carthamus* was valued by the ancients as a laxative medicine, and is still employed by the Asiatics for the same purpose, as well as for external application. It is most extensively used as a lamp-oil. The plant is however chiefly cultivated on account of its flowers, not only in China, India, and Egypt, but also in the south of Europe. The Safflower brought from China is the most valued, and fetches a much higher price than that from Bengal. The quantity imported into Great Britain in 1847 was 1128 cwts.

SAFFRON consists of the dried stigmas of the *Crocus sativus*, a plant native of Greece and Asia Minor, but extensively cultivated in Austria, France, Spain, and also formerly in England. The Sicilian saffron is said to be the produce of the *Crocus odorus*, but both in ancient and modern times this sort has been little esteemed. England is chiefly supplied from France and Spain; that of Spain being preferred. In Germany however Spanish saffron is not in such repute as the Austrian, great pains being taken in the cultivation of the plant in that country. When the flowers expand, and are thoroughly open under the influence of the sun, the stigmas, of which there are three,

are plucked out, a portion of one style remaining attached to them, and spread upon paper, to be dried either by means of portable kilns over which a hair-cloth or fine sieve is stretched, or in a room by the sun. The stigmas have a penetrating, aromatic, and, when in large quantity, stupifying odour, and a bitter aromatic taste; by mastication the mouth and saliva are rendered yellow. By long internal use of them many of the secretions acquire a yellow colour. According to Mr. Pereira, one grain of good saffron contains the stigmata and styles of nine flowers; hence 4320 flowers are required to yield one ounce of saffron. Saffron was formerly met with in two forms, Hay Saffron and Cake Saffron; the former is now alone in demand, the latter being entirely an artificial compound of the florets of the safflower, gum, and some other materials.

SAFFRON WALDEN. [Essex.]

SAGAN. [Liegnitz.]

SAGAPE'NUM, a substance yielded by *Ferula Persica*, which grows in Persia and other regions of the East. It is procured in the same way as assafœtida. It occurs either in tears or irregular masses, of a dirty brownish colour, containing in the interior white or yellowish grains. It is difficult to break (unless when very old), is tenacious, and not easily powdered, except in winter. It has the same alliaceous odour as assafœtida, but less powerful, with a nauseously bitter and acrid taste. It consists chiefly of resin, gum, and volatile oil. Its action on the human system is the same as that of assafœtida and other fetid gum-resins. [Assafœtida.]

SAGE. [Salvia.]

SAGE, LE, ALAIN-RENE', was born May 8, 1668, at the village of Sarzeau, in the department of Morbihan, in France. Le Sage was instructed in the Jesuits' College at Vannes, on leaving which he appears to have held for five or six years an office in the collection of the taxes in Brittany. Having been deprived of his office, he went to Paris in 1692, when his handsome person and agreeable manners, his talents, and his taste for elegant literature, procured him admission to the best society. Danchet, who was then professor of rhetoric at Chartres, persuaded him to produce, from the Latin version of Jaques Bongars, the 'Letters of Aristænetus,' which is rather an imitation than a translation. It was printed in 1695 at Chartres, but with the imprint of Rotterdam, 1 vol. 12mo, at the expense of Danchet.

Le Sage now devoted himself to literature. The Abbé de Lyonne bestowed upon him a pension of 600 livres; and to him also he appears to have been indebted for his introduction to the Spanish language and literature. He produced 'Le Traître puni,' a comedy in five acts, imitated from the 'Traicion busca el Castigo' of F. de Roxas (Paris, 1700); 'Don Felix de Mendoce,' taken from a piece by Lope de Vega (Paris, 1700); and 'Le Point d'Honneur,' a comedy in five acts, from the 'No hay Amigo para Amigo' of F. de Roxas, which was performed at the Théâtre Français, but with little success. Le Sage's next effort was 'Les Nouvelles Aventures de Don Quichotte,' translated from Avellaneda's frigid continuation of the work of Cervantes (1704–1706, 2 vols. 12mo.). In 1707 'Don César Ursin,' a comedy in five acts, imitated from Calderon, was performed at the Théâtre Français without success, while a little piece of his own, 'Crispin, Rival de son Maître,' played at Paris on the same day, had a brilliant run. Soon afterwards appeared his 'Diable Boiteux,' the name and idea of which he had taken from 'El Diablo Cojuelo' of Luis Velez de Guevara, of which indeed it is properly a continuation (Paris, 1707). Its success was prodigious. In 1726 he augmented the work by an additional volume, and in 1737 added to it the 'Entretien des Cheminées de Madrid,' and 'Les Bequilles du Diable Boiteux,' the first a continuation of the work by Le Sage himself, and the last a eulogy of it by the Abbé Bordelon.

Le Sage had offered to the Théâtre Français a piece in one act called 'Les Etrennes,' which was to have been performed Jan. 1, 1708, but the actors refused to play it; upon which Le Sage extended it to five acts, and gave it the title of 'Turcaret.' The piece was levelled at the corruptions of those who managed the revenue and farmed the taxes, who in vain attempted to bribe the author to suppress it. The play was at last acted by command of Monseigneur, Feb. 14, 1709, and the success was even greater than had been anticipated. This comedy is entirely Le Sage's own, and is greatly superior to any of those which he had borrowed from the Spanish. A little piece called 'La Tontine,' which had been accepted at the Théâtre Français, was not performed till 1732. Disgusted with this and other conduct of a similar kind, Le Sage resolved to relinquish the legitimate drama and the royal theatre. We find him in 1710 assisting his friend François Petis de la Croix, who was then beginning to publish his 'Mille et Un Jours,' by correcting the language and improving the style of the translation.

Le Sage's next work was his novel of 'Gil Blas de Santillane:' 2 vols., 12mo., were published in 1713, vol. 3 in 1724, and vol. 4 in 1735. Three different and indeed discordant charges have been made against Le Sage, as having no claim to be the original author of this work, which it was asserted he only translated from the Spanish. All these charges however have been refuted.

High as his reputation had now become, Le Sage was not ashamed to employ about twenty-six years of his life—from 1713 to 1738—in writing small pieces for the theatrical exhibitions at the fairs of St. Germain and St. Laurent. His independence of character caused him to prefer this honourable toil to the pension and patronage which he might have obtained. In the mean time however Le Sage was occupied with other compositions. His 'Roland l'Amoureux,' an imitation rather than a version of Bojardo's 'Orlando Innamorato,' was published in numbers from 1717 to 1721. In 1732 appeared 'Les Aventures de Guzman d'Alfarache,' a compressed imitation of 'La Vida y Hechos del Picaro Guz-

man de Alfarache' of Aleman, but superior to the original. In the same year 'Les Aventures de Robert dit le Chevalier de Beauchesne,' 2 vols., 12mo. This was followed in 1734 by the first two parts of 'L'Histoire d'Estevanille Gonzales, surnommé le Garçon de bonne Humeur,' 2 vols., 12mo. In 1735 he published 'Une Journée des Parques,' 12mo, a dialogue full of philosophy and wit. This was also the year in which he completed 'Gil Blas,' a work which he seems to have written especially for posterity, and to which he devoted a large portion of the best period of his life. In 1738, the year in which he produced the last of his little operas, he published 'Le Bachelier de Salamanca,' 2 vols., 12mo., and in 1740 'La Valise trouvée,' 12mo., anonymously, which consists of about thirty letters supposed to be written by different persons on satirical subjects. His last work was 'Un Mélange amusant de Saillies d'Esprit et de Traits Historiques les plus frappants,' 1 vol., 12mo.

Le Sage appears to have passed his life of literary activity in great domestic happiness, which was only disturbed by his eldest and his third son having become actors, a profession to which Le Sage had a strong dislike. At the end of 1743 he retired to Boulogne, with his wife and daughter, and there he died, Nov. 17, 1747.

The greater part of the works of Le Sage have been collected and published under the title of 'Œuvres Choisies de Le Sage,' Paris, 1783, 15 vols. 8vo., and 1810, 16 vols. 8vo. Most of his novels have been frequently reprinted, but especially 'Gil Blas.' It has been translated into all the languages of Europe; the English translation is by Dr. Smollett. 'Le Diable Boiteux' is translated into English under the title of 'The Devil on Two Sticks;' and there are also English translations of most of the other novels.

SAGERE'TIA, a genus of plants of the natural family *Rhamneæ*. The species are found in both South and North America, Java, China, and in India along the foot of the Himalayas. The only species which requires particular notice is *S. theezans*, which is remarkable as being employed as a substitute for tea, even in China, where the poor are described by Osbeck as making use of the leaves in the same manner as those of the true tea, and for which it makes a good substitute, from its astringency and fragrance.

SAGI'NA, the name of a genus of plants, belonging to the natural order *Alsinaceæ*. Four species are indigenous to Britain. They form small herbs, which are very generally diffused over the temperate regions of the globe.

SAGITTA (the Arrow). This constellation is one of the old ones, and is situated over the back of Aquila.

SAGITTA'RIA, the name of a genus of plants belonging to the natural order *Alismaceæ*. The species of this genus are water plants, and are found in the hotter and temperate parts of the globe, and are frequently remarkable for the beauty of their flowers. The only species indigenous in this country is the *S. sagittifolia*, Common Arrowhead.

SAGITTA'RIUS (the Archer), one of the constellations of the zodiac, the figure of which is that of a centaur drawing the bow, and situated below Aquila, between Scorpius and Capricornus: it must not be confounded with Centaurus.

SAGO, a word signifying, in the language of the Papuas, *bread*, since it constitutes the staple article of food of the inhabitants of the Eastern Archipelago and other parts where the plants which yield it grow. It is not a seed, as sometimes supposed, but the farina from the stem of several palms and palm-like vegetables, the chief of which are the *Sagus Rumphii*, *Sagus lævis*, *Saguerus Rumphii*, *Phœnix farinifera*, *Corypha umbraculifera*, some *Cycases*, and even a *Zamia*; but these last yield a very inferior sort. The seeds of *Dolichos Chinensis* are used in North America for bread; and also a starch procured from the tubers of the *Convolvulus batatas* is beat up with the farina of the *Euterpe caribæa* into sago in the West Indies. Of late years a very fine sago has been brought from Brazil, which is most likely procured from the *Mauritia flexuosa*, and some of the other magnificent palms of that country. Sago is a variety of starch, prepared by the plant for the use of the flowers and fruit, and is most abundant just before the evolution or appearance of the spadix or flower-bud, which is known by a whitish dust transuding through and covering the leaves. At this time the stem is cut down near the base, and then divided into pieces of five or six feet in length. A part of the outer hard wood is then sliced off, and the workman, coming to the pith, cuts across the longitudinal fibres and the pith together, leaving a part at each end uncut, so that when it is excavated there remains a trough, into which the pulp is again put, mixed with water, and beaten with a piece of wood; the fibres, being then separated from the pulp, float at the top, and the flour subsides. After being cleared in this manner by several waters, the pulp is put into cylindrical baskets made of the leaves of the tree; and, if it is to be kept some time, those baskets are generally sunk in fresh water to keep it moist, for the pulp will keep long if preserved from the air, but if exposed it presently turns sour.

The quantity yielded by one tree is prodigious. Five or six hundred pounds are not an unusual produce for one tree; and as the vegetation still remains after being felled, a stem again springs up, which goes through the different stages of growth till it is fit for the axe.

The flour or powder is rarely imported, granulated sago being the state in which it is commonly brought to Europe. To bring it into this state from the flour, it must be moistened and passed through a sieve into an iron pot (very shallow) held over a fire, which enables it to assume a globular form. Thus all our grained sago is half baked, and will keep long. Of this granulated sago there are two varieties, the common or brown sago, and pearl sago. The latter is in small hard horny or semi-transparent grains, about the size of a pin's head; the former are in larger grains, about the size of the grains of pearl barley. Both are inodorous, and with an insipid taste. They

swell in cold water, and are nearly thoroughly soluble in boiling water, so as to form a thick starch-like solution, which may be used as a pudding, or prepared in other ways as an article of diet for children and invalids, if a farinaceous diet is required.

SAGOUIN (*Callithrix*, Geoff.; *Saguinus*, Lacépède). The term Sagouin is employed by M. F. Cuvier to distinguish a group of South American Monkeys, characterised by the length of the tail, which is not prehensile. The body is slender.

Lesson arranges under the genus *Saguinus* several species, of which one is the *Saïmiri* of the natives of Guiana, and *Titi* of Humboldt (*Callithrix sciureus*, Geoff.). Cuvier however regards this species as the type of a distinct form, and separates it from the Sagouins, observing that in the Saïmiri the tail is depressed and the head flat, while in the Sagouins the skull is more elevated, and the canine teeth much longer.

The Saïmiri is a very beautiful species, little larger than a squirrel in size, and often kept by the natives of Brazil and Guiana in confinement. The general colour is greenish yellow above, becoming grayish on the thighs and arms; the feet, legs, and fore arms are reddish chestnut; tail, black at the tip; muzzle, dark; the rest of the face and ears, flesh coloured.

Saïmiri (*Callithrix sciureus*).

As examples of the true Sagouins, Cuvier adduces the Sagouin à Masque (*Callithrix personata*, Geoff.; *Saguinus personatus*, Less.), and the Sagouin en Deuil, or La Veuve (*Simia lugens*, Humboldt). This latter species appears to be rare. Humboldt saw only one specimen, and that in the forests bordering the rivers Cassiquiare and Guaviare. It is said to live in pairs. In captivity it is shy and timid when observed, but can display extraordinary activity. Humboldt states that the sight of a bird introduced to his specimen roused it in an instant; it darted upon the bird like a cat, and swallowed it instantly, its whole habit at such moments being that of a carnivorous animal.

General colour glossy black; face bluish white, surrounded by a narrow margin of a purer tinge; two white stripes run from the eyes to the temples; a band of white on the throat; outside of the forepaws white. [SAKIS.]

SAGRES. [ALGARVE.]

SAHA'RA, or SAHRA, is a country of immense extent, which occupies the central parts of Northern Africa. Its western extremity is washed by the Atlantic, along which it extends from Cape Nun, 28° 46′ N. lat., to the mouth of the river Senegal, 17° N. lat. The valley of the Nile constitutes the eastern boundary of the Sahara. The Sahara thus extends from 32° E. to 17° W. long., or about 2650 miles. The northern and southern boundaries are very imperfectly known. On the north the Sahara reaches to the base of the Atlas Mountains, and at one part, between 17° and 19° E. long., the Sahara reaches the shores of the Mediterranean. The southern boundary is best known towards the Atlantic, where it extends to the vicinity of the river Senegal, and between 15° and 4° W. long. approaches the parallel of 15° N. lat. Farther east the boundary follows a line varying from 14° to 17° N. lat. The average width N. to S. is about 1000 miles. The area is more than 2,500,000 square miles.

The Sahara is a desert, the greater part of which consists of a firm soil, in many parts composed of indurated sand, in others of sandstone. The surface of other tracts consists of rocks, especially granite, frequently mixed with quartz; while the rest is covered with a thick layer of fine loose sand. But whatever may be the soil in any given place, it is extremely poor, and almost entirely destitute of vegetation. The Sahara is situated in that part of the globe which separates the region of the winter rains from those of the summer rains, and it does not participate in either of them. This want of rain renders the whole region unfit for any kind of cultivation, but not uninhabitable, as the lower depressions contain a few wells, in the vicinity of which the soil is covered with grass and bushes that afford pasture to camels, goats, and sheep. The wells of drinkable water occur only at a distance of ten days' journey from one another, and sometimes the distance is still greater, so that travellers have the pains of thirst added to their other difficulties. In those tracts which are covered with fine loose sand, the whirlwinds often blow with great force, and raise a large portion of the sand to a considerable height, and deposit it again at some distance. Such pillars of sand have buried many caravans or caffilas.

There is however a track across the desert, in which these dangers are comparatively small. It lies between 13° and 16° E. long., and owes its advantages partly to its climate and partly to its soil. It is remarkable that this track occurs where no elevated country lies between the Mediterranean and the Sahara; at this spot, the northern winds, which frequently blow a gale, and bring moisture from the countries north of the Mediterranean, find access to the Sahara, and produce a considerable degree of cold even as far south as Mourzuk. To these winds also we may probably ascribe the rain which falls in this season in the kingdom of Fezzan, and renders it the most fertile tract of the Sahara.

The tract just noticed as traversing the desert

from north to south, divides the Sahara into two unequal portions, of which the western and larger is known among the natives by the name of Sahel, and the eastern and smaller among geographers by that of the Libyan Desert.

Coast.—The coast of the Sahara extends more than 1200 miles along the Atlantic. Modern surveys have shown that nearly the whole of this coast is elevated, and consists of sandstone, which in most parts rises to the height of 100 feet and more, but in some does not exceed 60 or 80 feet. These cliffs are generally separated from the sea by a narrow beach; but in some places their base is immediately washed by the ocean; and in others sand-hills are observed, which rise gently to a moderate height; at the back the country is generally elevated. A low coast only occurs between Cape Mirik (19° N. lat.) and the mouth of the river Senegal. The whole coast as far south as Cape Blanco is free from sand-banks and shoals, and has regular soundings. The depth gradually increases from the beach, and at the distance of four miles there are from 30 to 34 fathoms; at twelve miles, from 50 to 60 fathoms; and at the distance of thirty miles, about 100 fathoms. The water then deepens very suddenly. A large sand-bank however extends from Greyhound Bay (21° N. lat.) to Cape Mirik; it is known by the name of the Bank of Arguin. The currents for the most part run in the direction of the coast.

Soil.—The Sahel, or western part of the desert, is by far the worst part of the Sahara. It does not appear that in all this vast extent a single oasis occurs the soil of which is fit for agriculture or for the growth of date-trees. The soil however varies greatly, passing from a fine to a coarse sand and gravel, and then gradually to a bare layer of broken stones and rocks. The country along the coast is far from being entirely destitute of inhabitants, as they always make their appearance when a vessel approaches or is cast on the shore. It would also appear that at no great distance from the sea the country contains extensive pasture-grounds though of very inferior quality, and frequently interrupted by tracts which are completely sterile. Farther inland desert tracts entirely destitute of vegetation and inhabitants occupy a much greater portion of the country. The Libyan desert, or eastern part of the Sahara, contains a considerable number of oases or fertile tracts, which support a moderate population. Nearly all of them contain extensive groves of date-trees and fields in which millet is grown.

Climate.—No rain falls along the coast south of Cape Juby; but some showers fall annually in the countries south of Mount Atlas. These showers fall between August and November. Along the coast heavy dews occur in the summer months, but they appear to be quite unknown in the interior. In the interior the wind blows almost without interruption from the east, and in the day-time frequently with the violence of a gale, which however is generally followed by a dead calm after sunset. The strong wind moderates the heat of the burning sun, and hence the nights are usually more insupportable than the noon-day heat. The violent gales frequently raise the loose sand in such quantities, that a layer of sand, rising about twenty feet above the surface of the ground, seems to divide the purer atmosphere from the earth. This sand, when agitated by whirlwinds, sometimes buries whole caravans, and often puts them into the greatest confusion. The degree of heat to which these countries are subject has not been determined by exact observation; the highest temperature recorded was 140° Fahr.

Productions.—The most useful domestic animal is the camel, without which these extensive deserts could not be traversed. The goat is very abundant in the Sahel, as the dry pastures are more adapted to it than to sheep. Sheep however are also common. There are some black cattle of a small breed, but only in those places which have good pasture. Horses are rare in the Sahel, but more numerous farther east. There are lions and panthers, and some other smaller wild animals. Gazelles are frequent in all places where bushes and shrubs occur, and in a few places antelopes also are met with. In the deserts bordering on Egypt the dipus jerboa abounds. In the Sahel ostriches are very numerous, and they are hunted by the natives for their feathers. Vultures, ravens, snipes, wild ducks, and Guinea-fowl, are met with. There are also serpents in the desert.

The vegetable productions are few in number. Date-trees are only found in the oases of the eastern districts and at the foot of Mount Atlas. The Tibboos, a native tribe of the Libyan desert, cultivate a species of millet and a little cotton. Among the wild plants there are some species of mimosas, acacias, and a thorny plant which affords food to the camel. Near the most south-western corner of the Sahel are extensive woods consisting of acacia-trees, from which by far the greatest part of the gum is obtained which in Europe is consumed under the name of gum arabic. It is collected by the Moors, and then sold to the French and English merchants in St. Louis on the banks of the Senegal River. The minerals are limited to iron-ore and salt.

Inhabitants.—A great number of independent tribes are dispersed over the Sahara. They belong to four nations, the Moors, the Tuaricks, Tibboos, and Arabs. The Moors seem to be in possession of the whole country west of the road leading from Timbuctoo to Drah; and they partake of the characteristics both of the pure Moor and of the Negro. The Tuaricks occupy the centre of the Sahara; they belong to the aboriginal inhabitants of Northern Africa, who are known by the name of Berbers, and in Marocco are called the Amazirghis. The Tibboos occupy the tract between Fezzan and Lake Tchad, and an extensive country extending east of this line towards the boundary of Egypt. In features they strongly resemble the negroes. The Arab tribes dwell along the boundary-line of Egypt and Nubia.

Commerce.—Though the Sahara only supplies three commercial products, salt, gum arabic, and ostrich feathers, a considerable traffic is carried on between the countries north and south of the

desert, which is frequently traversed by caffilas, or caravans, consisting of from 200 to 500 persons, and of from 500 to 2000 camels. A camel's load is five hundred pounds. The caravans export from the countries situated on the Mediterranean chiefly goods of European manufacture, such as fire-arms, gunpowder, and some cotton stuffs, to which are added some articles manufactured at Fez, and tobacco, dates, &c. Their returns consist of gold, ostrich feathers, ivory, and slaves. In traversing the desert they usually buy large quantities of salt, which they sell in Soodan at a great profit. One of the caravan routes is from Tripoli to Bornou, and another from Fez to Timbuctoo; there are three or four others of minor importance.

Discoveries.—The Greeks and Romans were acquainted with portions only of the northern and eastern margins of the Sahara. The coast of the Sahara was discovered by the Portuguese between 1412 and 1443, but the interior of that country was nearly unknown up to the end of the 18th century. Browne succeeded (in 1793) in penetrating to Dar-Fur, with the Soodan caravan, through the oases which lie west of the valley of the Nile. A few years afterwards, Mungo Park and Hornemann gave further information concerning the Sahara. In 1819 Captain Lyon entered Africa from Tripoli, and collected much interesting information concerning the Sahara, which was published in 1821. Denham, Clapperton, and Oudney (1822–1824), following the same route, not only traversed the desert in all its width from Tripoli to Bornou, but discovered a considerable extent of Soodan. In 1825 Major Laing departed from Tripoli, and reached Timbuctoo, but was murdered on his way back. Caillié, a Frenchman, in 1827 traversed the southern portion of Senegambia, between 10° and 12° N. lat., and then passed through the western countries of Soodan to Timbuctoo, departed from the last-mentioned place, and reached Fez by the route which is frequented by the caravans that carry on the trade between Soodan and Marocco. A few years ago Davidson made an attempt to reach Timbuctoo by the route from Wady Nun to Tatta, and hence to rejoin the great caravan road, but he was murdered by the natives.

All the nomadic tribes which inhabit the Sahara are independent; but Fezzan and Gadames are subject to Tripoli, and the oases along the western edge of the valley of the Nile, as well as Siwah, depend on the Pasha of Egypt.

SAIL, a quantity of canvass attached to the yards or stays of a boat or ship in order to receive the impulse of the wind, and thus give motion to the vessel. The depth of a sail is capable of being diminished at pleasure, according to the force of the wind, by means of the reef-points.

The principal sails of large vessels can be placed at right angles to the direction of the keel of the ship, and this position is given to them when the vessel goes before the wind; in other cases the same sails may by means of the braces be placed obliquely to the keel. The sails which are attached to the ship's stays, and the sails of boats or small vessels, are when supine in a vertical plane passing through the keel; a certain degree of obliquity to that plane may however be given to them at their lower extremities, if necessary. Sails are strengthened by cords sewn along their edges in order to prevent them from being easily torn by the action of the wind.

The *Storm Sails* patented in 1844 by Mr. Archibald Trail are made in the usual manner, and are subsequently strengthened by sewing to their surface a number of canvass bands about an inch broad, with cords woven in them, such bands being secured at their ends into the bolt-ropes, or cords forming the boundaries of the sail, and carried diagonally across the surface of the sail at an angle of 45° with the seams, and at a distance of about three feet from each other. Two sets of bands are used, crossing the sail in opposite directions, one set being attached on each side of the canvass. By this simple contrivance the strain is so equalised as to render tearing less probable than with an ordinary sail; while, if any injury be inflicted, the rent is confined within the narrow limits of one of the diamond-shaped compartments into which the sail is divided by the protecting bands.

When a vessel is in still water, the pressure of the wind against the sails overcomes its inertia, and motion takes place in some direction. The motion goes on increasing by the accelerative power of the wind, as the motion of a descending body is accelerated by the force of gravity; but at the end of a certain time the resistance in an opposite direction, both of the air against the sails and hull of the ship, and of the water against the latter, becoming equal to the accelerative power of the wind, the ship acquires a terminal or uniform velocity, and in this state (neglecting the resistance of the air) there may be said to be an equilibrium between the pressure of the wind against the sails and of the water against the vessel.

The principal problem connected with the motion of vessels on the water has for its object the determination of the relation between the velocities of the wind and of the vessel; and its solution consists in finding algebraic expressions for those pressures, and making them equal to one another. But many practical difficulties present themselves in investigating that relation; for the pressure of the wind is modified by the form which the sail assumes when acted upon, by the obliquity of the wind's direction to the general plane of the sail, and by the interference of one sail with another, by which interference the wind may be partly intercepted, or currents may be produced in directions different from the general direction of the wind. The resistance of the water is also greatly modified by the form of the ship's hull and by the direction of its motion with respect to the line of the keel. These difficulties cannot be removed; therefore the results of mathematical researches concerning the motion of ships can only be considered as very remote approximations to the rules which should guide the practice of the seaman.

The pressure of the air perpendicularly against a plane surface equal to one square foot is usually estimated at $\frac{1}{300}$ lb. avoirdupois, the surface pressed

being at rest, and the wind moving with a velocity equal to one foot per second, or about 0.68 mile per hour; also the resistance of water against a like surface and moving with an equal velocity is estimated at 1.5 lb. The pressure or resistance, by the laws of hydrodynamics, varies with the square of the velocity; and the effective force with which a fluid strikes a plane surface obliquely varies, if the inclination be very small, with the square of the sine of the inclination to the plane. From the experiments of Dr. Hutton it is found that at inclinations between 50° and 90° the pressures vary nearly as the sines of the inclinations.

In determining the pressure of a fluid against the surface which is in motion, it must be observed that, by the laws of the collision of bodies, the efficient velocity of impulse is to be expressed not by the absolute but by the relative velocity of the impelling power. Hence, when the wind and ship are moving in the same direction, the effective velocity is the difference, and when they are moving in opposite directions, it is the sum of their several velocities.

Now when a ship sails before the wind in still water, if we consider the sail as a plane surface at right angles to the keel of the ship and to the direction of the wind; representing the pressure of the air on a square foot, when the velocity is one foot per second, by P, and the pressure of the water on a square foot with an equal velocity by P′; also putting V for the velocity of the wind, and V′ for that of the ship, both being expressed in feet per second; A for the area of the sail, and A′ for that of a vertical section through the immersed part of the ship taken perpendicularly to the keel; the equation of equilibrium will evidently be

$$\text{A. P. } (\text{V} - \text{V}')^2 = \text{A}'. \text{P}'. \text{V}'^2;$$

and from this equation V′ may be easily found. It follows from the same equation that, when the other terms are constant, $\frac{\text{V}'}{\text{V} - \text{V}'}$ varies with $\sqrt{\text{A}}$, or the velocity of the wind in the sail is to the velocity of the ship as unity is to the square root of the surface of the sail.

When a ship is in motion, the efficient direction and velocity of the wind in a sail are not the same as they would be if the ship were at rest; and it may be easily shown, by the Composition of Forces, that they are represented by the diagonal of a parallelogram formed on two lines, one representing the actual direction and velocity of the wind, and the other the direction and velocity of the ship. The difference between the actual and efficient directions is called the *heading* of the wind.

For investigations of the angles between the plane of a sail and the true direction of the wind, and between the same plane and the line of the ship's motion which will render the velocity of the ship a maximum; also, for the determination of the course of a ship and the position of a sail so that the ship may recede with most rapidity from any point of danger, the reader is referred to Maclaurin's 'Fluxions,' arts. 912 and 917.

Since the lee-way, which a ship always makes when her sails are oblique to the direction of the wind, destroys the equality of the reaction of the water which would take place on the two bows if her movement were in the direction of her keel, and gives rise to an excess of pressure against the lee-bow; it follows that in these circumstances the ship's head is constantly forced to windward, and that the tendency of the ship to turn on the axis of the rotation is so much greater as the bows are more acute. To oppose, in some measure, this tendency, the quantity of sail in front of the centre of rotation is greater than that which is behind it; but, notwithstanding such disposition, it always requires some movement of the rudder to complete the counteraction.

SAILING, or the SAILINGS, a term applied to the different ways in which the path of a ship at sea and the variations of its geographical positions are represented on paper. It is also applied occasionally to the rules by which, in particular circumstances, a ship's place is computed.

Plane Sailing, *Parallel Sailing*, *Middle Latitude Sailing*, and *Mercator's Sailing* have been briefly explained under RECKONING AT SEA; and *Globular Sailing* is defined under that head. That which is called *Great Circle Sailing* consists in determining a series of points in an arc of a great circle between two points on the surface of the earth, supposed to be a sphere, for the purpose of directing a ship's course as nearly as possible on such arc; that is, on the curve of shortest distance between the place from which she sets out and that at which she is to arrive.

It is seldom possible for sailing ships to attempt the navigation of the seas by great circle sailing, because their courses are necessarily governed by the direction in which the wind is blowing, but there seems no reason to doubt that the method would generally succeed with ships which are impelled by steam, as the directions of their movements are more immediately under the control of the helmsman.

If the points of departure and arrival be not in the direction of a meridian, the equator, or of any parallel of latitude, and the latitudes and longitudes of those points be given, the distance between those points, on a great circle of the sphere, and the two angles of position (the angles between the meridians of the two points and the great circle joining them) may be computed. Then points being assumed on the arc, at equal intervals of longitude, such that their differences of longitude or latitude may not exceed four or five degrees and that each portion of the arc may be considered as coincident with some rhumb line, the lengths of the portions and their angles of position are to be computed: these angles indicate the several courses on which the ship is to proceed, and the lengths are the several distances to be passed over. In these computations the rules of spherical trigonometry may be employed, but the operations will be facilitated by the use of the spherical traverse tables. (Raper, 'Practice of Navigation,' p. 71.)

Traverse Sailing is merely a general term for the determination of a single course equivalent to a series of successive courses, whatever be the manner of finding the lengths of the lines forming the triangles.

Current Sailing is the method of determining the true motion of a ship, when, besides being acted upon by the wind, she is moving in a current. [Reckoning at Sea.]

Windward Sailing is that mode of navigating a ship in which the ship endeavours to gain a port situated in the direction whence the wind is blowing. The ship in this case is made, by frequent tacking, to sail as near as possible to the wind.

SAINFOIN, *Hedysarum onobrichis*, is a plant of the family of the *Leguminosæ*, which grows luxuriantly and spontaneously on the calcareous mountains of the middle and south of Europe. It has been in regular cultivation for upwards of two centuries for the purpose of supplying fodder for cattle, either in the green state or when converted into hay. There are few plants which have more rapidly improved the value of poor thin calcareous soils than sainfoin; and in the richer kinds of loam, which contain a considerable proportion of calcareous matter, its value surpasses even that of broad clover, giving fully as great a return, with a much smaller expenditure of manure. The plant has a strong woody and fibrous root, which insinuates itself into the fissures of calcareous rocks, and finds moisture in the dryest seasons, while its spreading fibres keep the earth from being washed down the steep slopes of the hills. Being nearly perennial, or at least of many years' duration, it binds the soil together. In favourable situations, it may be made into hay twice in the year, or cut oftener as green fodder. In the most arid and exposed situations, it gives at least one good crop of hay. The plant grows about two feet high, and the stem, which branches out into many compound leaves, is crowned with a beautiful spike of flowers of the papilionaceous kind. After it has been mown, it shoots out rapidly again, and may be advantageously depastured by every kind of cattle or sheep. The duration of sainfoin depends on the nature of the soil, and the state it was in with respect to weeds when it was sown. A cold wet subsoil soon destroys the roots, whereas a free and dry one, whether rocky or gravelly, gives them vigour. It is usually sown in spring in a crop of barley or oats, which should be sown thin in order that the sainfoin may not be smothered. The sainfoin does not produce a large crop the first year; for some of the seeds will lie a twelvemonth in the ground before they spring up. It is in perfection after the second year, when a portion may be reserved for seed. Sainfoin hay is extremely nourishing for every kind of cattle, especially if it has been made without rain.

When sainfoin begins to appear thin on the ground, and other plants seem to get the better of it, the ground should be broken up. The land will be found much improved in fertility by the sainfoin. A poor chalk or gravel, which before would scarcely repay the seed sown in it, will now, by the gradual decay of the roots and fibres of the sainfoin, produce several good crops without any other manure. The prudent farmer however will not entirely destroy, by repeated crops of grain, that cohesion of the soil which is produced by the roots of the sainfoin; but by a judicious course and proper application of the manure, which the sainfoin enabled him to make, he will keep up the newly-acquired fertility until, in the course of ten or twelve years, he can again sow sainfoin seed in it with the prospect of a crop more abundant than the first.

There is nothing peculiar in the manner in which sainfoin is made into hay. It should not be shaken about too much, for fear of injuring the flower and breaking off the leaves.

SAINT, derived from the Latin 'sanctus' through the French 'sainct,' properly signifies a holy or pious person, and is so used in the Christian church. From the commencement of the Christian religion, great veneration was always shown to persons remarkable for their holiness or piety, and their memory was cherished after their death. It was decreed by the ecclesiastical councils in the ninth century, that no departed Christian should be considered as a saint to whom prayers might be addressed, until the bishop in a provincial council, and in the presence of the people, had declared him worthy of that honour. Even in that century many divines thought that it was proper that the decisions of bishops and councils should be confirmed by the consent and authority of the pope. It was not till the following century that any person was sainted by the bishop of Rome alone; and this honour was first conferred on Udalric, bishop of Augsburg, by John XV. Shortly afterwards the privilege of declaring departed Christians to be saints was confined to the pope; and the creation of saints was distinguished by the name of canonization.

The invocation of saints in the Roman Catholic church is frequently stigmatised as idolatry; and the church of England condemns the Romish doctrine on the subject as 'a fond thing vainly invented, and grounded upon no warranty of Scripture, but rather repugnant to the word of God.' (Article xxii.) In this, as in any other case of religious controversy, it is right to take the account of the doctrine from the persons who believe in it, and not from a statement of their opponents. Thus Bellarmine says, 'It is not lawful to ask of the saints to grant to us, as if they were the *authors* of divine benefits, glory, or grace, or the other means of blessedness.' The doctrine of the Roman Catholic church is explicitly stated in the council of Trent: 'Though the church has been accustomed sometimes to celebrate a few masses to the honour and remembrance of saints, yet she doth not teach that sacrifice is offered to them, but to God alone, who crowned them; wherefore neither is the priest wont to say, I offer sacrifice to thee, O Peter, or O Paul, but to God.' ('Sess.,' 22.)

The Lives of the Saints have been written in the 'Acta Sanctorum,' 45 vols., fol.; and in Alban Butler's 'Lives of the Saints,' 12 vols., 8vo.

SAINT HILAIRE, GEOFFROY ÉTIENNE, was born at Etampes, in France, April 15, 1772. He was destined by his father for the church, and received the appointment to a canonry in his twelfth year. He was however sent to the College of Navarre, where Brisson lectured on

experimental philosophy, and under him he acquired a taste for the natural sciences. He first devoted himself to mineralogy, in which Haüy was his preceptor. On coming to Paris he studied very diligently, and in 1793 was appointed subcurator and demonstrator of the Natural History cabinet, in the Jardin des Plantes. He was subsequently appointed professor of zoology, and lectured conjointly with Cuvier. In 1798 he accompanied the French expedition to Egypt. He was made a member of the Institute in 1807, and appointed professor of anatomy and physiology in the faculty of sciences in 1809. In 1815 he was returned as a member of the Chamber of Deputies for his native city of Etampes. He died at Paris in July, 1844.

Geoffroy St. Hilaire was one of the most assiduous cultivators and ablest expounders of what is called philosophical anatomy. The idea on which this department of science was founded had been developed in Germany, and successfully applied to zoology and comparative anatomy during the latter part of the last century. It was however amongst the rich collections of the Jardin des Plantes, and the activity and zeal of such men as Cuvier, Lamarck, Temminck, Desmarest, Valenciennes, Serres, and St. Hilaire, that it received its most important applications and its greatest development.

SAINT-IVES. [Cornwall; Huntingdonshire.]

SAINT-JOHN, HENRY. [Bolingbroke.]

SAINTE-MARIE-AUX-MINES. [Rhin, Haut.]

SAINTES. [Charente-Infe'rieure.]

SAINTONGE, the territory of the ancient *Santones*, a tribe of Celtic Gaul, was included in the Aquitania Secunda of the Romans. It subsequently formed part of the duchy of Guienne, and passed with the Duchess Eleonore to Henry II. of England. It belonged to the English kings till Charles V. reunited it to the dominions of France. It now forms the greater part of the departments of Charente and Charente-Infe'rieure. The chief towns were Saintes and St.-Jean-d'Angely.

SAKIS. [Sagouin.] The genus *Pithecia* of Desmarest and Illiger comprehends those American Monkeys which are generally known by the name of *Sakis*, or rather those Sakis which have for the most part long and bushy tails, and hence have obtained the name of Fox-Tailed Monkeys, for the term *Saki* in its general application designates any American Monkey whose tail is not prehensile. In the genus *Pithecia* the head is round; the muzzle short; the ears moderate and rounded; the canine teeth very strong; the tail shorter than the body, bushy, and not prehensile. Habits nocturnal, and mostly gregarious. In none of the American monkeys is the thumb of the forepaws opposeable to the fingers. This circumstance was first pointed out by Azara, but was overlooked by subsequent naturalists, till Mr. Ogilby, in the year 1833, published his rediscovery of this character. ('Penny Cyclopædia,' vol. i., p. 442.) In all the American monkeys moreover the nostrils are wide apart, and the nails, excepting those of the hinder thumbs, are clawlike. Callosities and cheek pouches are always wanting. The following may be adduced as examples of the genus *Pithecia*.

The Cuxio, or Jacketed Monkey (*Pithecia sagulata*, Traill; *Cebus satanas*, Hoffm.; *Simia chiropotes*, Humboldt; *Brachyurus Israelita*, Spix).

In this species the head, limbs, and tail are black; the general tint of the back and top of the shoulders is grizzled rusty brown or brownish gray, differing in depth in different individuals. The under parts are scantily clad. The hair of the head radiates from a point on the occiput, and on the sides of the forehead forms two conspicuous tufts, with a depression between them; these tufts fold over and conceal the ears. The face is black, and furnished at the sides with full bushy whiskers, which meet under the chin, forming an enormous glossy black beard, directed obliquely forwards, and which gives a peculiar aspect to the physiognomy. Canines formidable. Locality, the forests of Brazil, Para, and the banks of the Orinoco. This species is subject to variety in colouring; and the *Capuchin of the Orinoco*, which Humboldt regarded as a distinct species, is probably the same as the Cuxio.

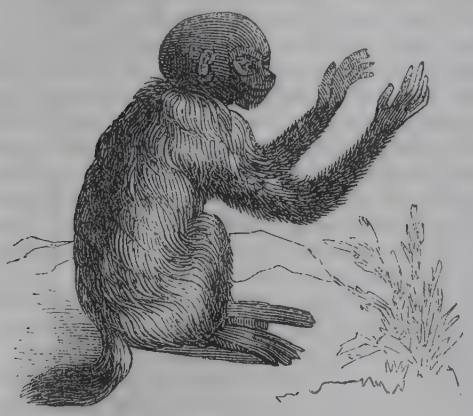
Humboldt says that of all the monkeys of America the *Capuchin of the Orinoco* bears the greatest resemblance in its features to man. The eyes have a mingled expression of melancholy and ferocity, and the facial angle appears much less than it really is, in consequence of the chin being concealed by the long thick beard. Strong, active, and fierce, it is very difficult to tame, and when its angry passions are roused, it raises itself upon its hinder extremities, and leaps round the aggressor, grinding its teeth. It drinks but seldom; when it does so, the draught is not taken by applying the lips to the liquid, as the other American monkeys do, but the water is taken up in the hollow of the hand, and carried to the mouth, the head being inclined on the shoulder. The spectator who would see this action, which is performed with great deliberation, must remain concealed. If the beard is wetted, the Capuchin becomes furious, and it is Humboldt's opinion that the method of drinking above described has been adopted from the impossibility of applying the lips to the water in the ordinary way without wetting the beard.

Sir Robert Kerr Porter, in his description of the *P. sagulata* ('Proc. Zool. Soc.,' 1834, p. 41), distinctly states that the animal drinks frequently, bending down and putting its mouth to the water, apparently heedless of wetting its beard, and indifferent to lookers on. Individuals in our menageries drink like other monkeys. Those which we have seen in captivity have displayed a sullen, morose, and savage temper.

The Cacajao (*Simia melanocephala*, Humb.; *Pithecia melanocephala*). This monkey is doubtless identical with the *Ouakary* of Spix, which he noticed in troops in the forests between the rivers Solimoens and Iça (Brazil). Humboldt only met with one individual, which was kept in an Indian hut at San Francisco Solano.

Head very round, naked, and of a dull black colour; its physiognomy reminding the spectator

of an old negro. The hair of the head directed forwards; eyes large and sunk, and the eyebrows composed of strong bristles. Nose flat; separation of the nostrils wide. No beard. Ears bare and very large. Body covered with yellowish-brown, straight, long, and shining hair; but the breast, belly, and outsides of the arms are of a lighter hue. Hands black, fingers very long, nails flattened. Tail thick, about a sixth shorter than the body, and of the same colour, except at the end, which is black.



Cacajao (*Pithecia melanocephala*).

This species feeds on fruits. It is inactive and timid. When about to seize anything it stretches forth its arms in a singular manner, but holds the object with difficulty, on account of the length and slenderness of its fingers.

SAL AMMONIAC. [Ammonia.]

SALA'CIA, a name applied to a genus of plants of the natural family of *Hippocrateaceæ*.

SALADIN. [Salah-ed-Deen.]

SALAH-ED-DEEN (*Malek-al-Nasser Salah-ed-Deen Abu-Modhaffer Yusef*), better known to European readers by the famous name of *Saladin*, was born A.D. 1137 (A.H. 532), in the castle of Tecrit on the Tigris, of which his father Ayub, a Koord of the tribe of Ravendooz, was governor for the Seljookian sovereign of Persia. Ayub and his brother Shîrakoh subsequently transferred themselves to the service of Zenghi, atabek of Syria, by whose son, the famous Sultan Noor-ed-Deen [Noureddin], they were raised to high military honours; and when Shîrakoh (in 1163) was appointed general of the troops designed to reinstate the Vizir Shawer in Egypt, a subordinate command was entrusted to his nephew. When the subjugation of Egypt was completed, A.D. 1168, Shîrakoh became, with the nominal rank of vizir to the Fatimide caliph, viceroy of the kingdom for Noor-ed-Deen; but dying the same year, bequeathed his authority to his nephew. The extinction of the Fatimides A.D. 1171, left Salah-ed-Deen virtually sovereign of Egypt; and on the death of Nour-ed-Deen A.D. 1173, and the accession of Malek-al-Saleh Ismail, a boy eleven years old, Salah-ed-Deen seized Damascus, which he occupied unopposed (1174). Emesa, Hamah, and other towns dependent on Damascus, shared its fate; and when Malek-al-Saleh attempted to regain them by the aid of his cousin Seif-ed-Deen Ghazi, atabek of Mosul, the combined forces were routed in two great battles, and Saleh, besieged in Aleppo, was forced to purchase peace by the cession of all southern Syria. Salah-ed-Deen now assumed the title of Sultan, and extended his diminions from Yemen to Mount Taurus in Cilicia, and from Tripoli in Africa to the Tigris, the continuity of his rule being interrupted only by the Latin kingdom of Jerusalem, with which the violation by Reginald de Chatillon of a four years' truce soon afforded him a pretext for hostilities. In the famous battle of Hittin, or Tiberias (July, 1187), the Christians, betrayed by the Count of Tripoli, were utterly overthrown; the king, Gui de Lusignan, was taken prisoner, and received by the victor with royal generosity; while his partner in captivity, Reginald de Chatillon, was decapitated as a punishment for his perfidy by the hand of Salah-ed-Deen himself. All the towns of the Frank kingdom now rapidly fell before the arms of the Sultan; and his triumph was crowned by the capture of Jerusalem, which surrendered after a siege of fourteen days (Oct. 2, 1187), after having been 88 years subject to the Franks. The next two years were principally employed in reducing the fragments of the Latin dominion; but Tyre was successfully defended by Conrad of Montferrat, and the appearance of the third Crusade (1189) enabled the Christians again to take the field.

In the spring of 1192 hostilities were resumed; and the Franks, led by Richard, king of England, penetrated to within a short distance of Jerusalem, where Salah-ed-Deen awaited their attack; but the dissensions of the Crusaders occasioned their retreat, and both sides were not unwilling to listen to terms of accommodation. The three years' truce, which was concluded Sept., 1192, left Jerusalem to the sultan, while the Christians were confirmed in possession of the coast from Jaffa to Tyre. Salah-ed-Deen died a few months after the termination of the war, March 4, 1193.

The character of Salah-ed-Deen has been, like that of his predecessor Noor-ed-Deen, a favourite theme for eulogy among the writers both of the East and the West. His zeal for the improvement of his territories was attested by the erection of numerous fountains and caravanserais, particularly on the road to Mecca; and the numerous public buildings with which he decorated his first and favourite realm of Egypt still remain as monuments of his splendour.

SALAMANCA, a province of Spain formed out of the south part of the old kingdom of Leon, is bounded N. by the provinces of Zamora and Toro, N.E. and E. by those of Valladolid and Avila, S.E. and S. by those of Toledo and Estremadura, and W. by Portugal, from which it is separated by the Duero, the Turones, and the Agueda. The area is 5606 square miles, and the population according to the census of 1833 was 210,314. High ranges of mountains, which take the names of Sierra de Gredos, Sierra de Francia, and Sierra de Gata, cover the south of the province; these mountains are a continuation of the Sierra de Avila, which send out also a range of hills across the province in a north-west direction. The rest of the pro-

vince presents a plain inclining generally to the north-west, and watered by—the Tormes, which rises in the Sierra de Gredos, and flows N.W. past Salamanca into the Duero; the Yeltes, which rises in the Sierra de Francia, and joined by the Huebra on the right bank enters the Duero 20 miles lower down; and the Agueda, which flows out of the Sierra de Gata, N.N.W. past Ciudad-Rodrigo, and is joined by the Turones, a river on the western boundary; their united waters enter the Duero on the left bank about 16 miles lower down. A small portion stretches over the southern slopes of the sierras, and, drained by the Alagon and some of its feeders, belongs to the basin of the Tajo. The surface of the great plain is mostly arid and bare, except along the river-courses, where irrigation is adopted; the climate is dry and warm; the chief products are wine, fruits, corn, oil, and madder. In the mountains there are good summer pastures, and extensive chestnut and oak forests. Cattle and swine are fed in great numbers. The minerals are gold, copper, iron, lead, rock-crystal, alum, and saltpetre.

The capital of the province is SALAMANCA.

Ciudad-Rodrigo, 16 miles from the Portuguese frontier near the right bank of the Agueda, which is here crossed by a bridge of 7 arches, is a strongly-fortified town defended by a citadel, and has 11,000 inhabitants. It gives title to a bishop who is a suffragan of the Archbishop of Santiago. The streets are regular, and the houses pretty well built. Among the principal public buildings are the cathedral, one collegiate and 6 parish churches, the college, the ecclesiastical seminary, 2 hospitals, and several convents. Woollen stuffs, linen, leather, and soap are the chief industrial products. The town was built in the reign of Fernando II. on the site of the ancient Lancia-Transcudana. In the principal square there are three Roman columns with inscriptions. Ciudad-Rodrigo was taken by the Portuguese in 1706; the French seized it in 1810, and held it till 1812, when they were driven out by the English, who stormed the town.

SALAMANCA, the Roman *Salmantica*, a city of Spain, and the capital of the province of Salamanca, is built in the form of an amphitheatre on the banks of the Tormes, which washes part of its walls. Its numerous stately buildings and fine old churches give this city so venerable an aspect that the Spaniards call it 'Roma la Chica,' or Little Rome. The new cathedral, begun in 1513, but not finished till 1734, is a magnificent building, in a style partly Gothic and partly Italian; it is ornamented with exquisite oak carvings, marble sculptures, and some good paintings. Its length is 378 feet, its width 181, and its height 130 feet. Close to this is the old cathedral, a very remarkable gothic building of the 12th century, containing many interesting monuments. Besides the above, there are in Salamanca 25 parish churches and a great number of monasteries. During the middle ages this city acquired great celebrity by its university, founded in A.D. 1200 by Alfonso IX. of Leon. Its professors became eminent by their acquaintance with the Arabian writers on medicine and philosophy, and through them with the writings of the Greeks. The university buildings consist of two divisions, separated by a wide street. There are 25 colleges attached to it, besides 4 superior colleges, designed for the children of the nobility, two of which deserve particular notice for their size and architecture. The Jesuit college is appropriated to the use of Irish students.

The city is badly built, with narrow, crooked, and dirty streets. It has however some fine squares with ornamental fountains. The principal square, which is in the centre of the city, is a quadrangle surrounded by an arcade, embellished with marble medallions, representing several Spanish heroes, and all the kings of Castile and Leon, down to Charles III., under whose reign the square was built. Salamanca suffered greatly during the Peninsular war, having sustained several sieges, during which some of the finest monastic buildings were either completely destroyed or riddled with cannon-shot. The British under Wellington defeated the French under Marmont near Salamanca, July 22, 1812.

The Roman Salmantica was a municipium of the province of Lusitania. A portion of the Roman wall which surrounded the city is standing, as well as a colossal bull, and several stones with inscriptions. The splendid bridge over the Tormes rests on the piers of Trajan's bridge. Salamanca has 20,000 inhabitants. It stands in 41° 5′ N. lat., 5° 42′ W. long.

SALAMANDER. [SALAMANDRIDÆ.]

SALAMANDRIDÆ, a family of Batrachian Reptiles. [REPTILES; AMPHIBIA; AXOLOTL; AMPHIUMA; PROTEUS; NECTURUS; SIREN.]

Tschudi ('Classification der Batrachier'), the Prince of Canino ('Amphibia Europæa ad Systema nostrum Vertebratorum ordinata'), MM. Duméril and Bibron ('Erpétologie Générale'), and other zoologists, have published their views respecting the arrangement of the Batrachians, and of the families and genera into which they are divided. We may here also refer to Merrem ('Materials for a Natural History of Amphibia'), to Mr. Gray ('Synopsis of the Contents of the British Museum,' 1840), and to Mr. Bell ('British Reptiles').

Confining our attention to the *Salamandridæ*, it may be observed that an elaborate account of their osteological peculiarities is given by Cuvier in his 'Ossemens Fossiles.' The student should also consult Professor Owen's admirable 'Odontography,' in which will be found a very able exposition of the dentition of the Batrachians generally, showing the gradation by which that order of reptiles is linked to the Fishes on the one hand, and the Saurians on the other, and the various stages of development by which the Batrachians are connected with each other.

The Salamandridæ are extremely tenacious of life, and have moreover the power of reproducing excised or injured parts. Bonnet has given accurate descriptions and figures of his experiments. The arms or thighs of Tritons amputated, sometimes on one side, sometimes on the other, or both on the same side, were constantly reproduced, and the toes were gradually again formed and endowed with motion. The tail too, cut off at various

points, was renewed, pushing out by little and little from the amputated base. In one case the same limb was reproduced four times consecutively in the same animal. Bonnet found that this reproduction was favoured by heat and retarded by cold. He observed that the parts of excised limbs were often reproduced with remarkable alterations, either of defect or excess; the deficiency or exuberance of certain parts taking upon themselves very singular forms. In many species of Tritons the long bones of the limbs detached from their principal articulation, and remaining suspended by some points which still caused them to adhere to the flesh, were found completely consolidated in a few days. The most extraordinary observation was, that after the total extirpation of the eye, it was entirely reproduced and perfectly organised at the end of a year. Dufay has recorded their faculty of remaining frozen up in ice for a long period without perishing.

The *Salamandridæ* are divided into the genera *Menopoma, Sieboldtia, Triton, Lissotriton,* and *Salamandra.*

Menopoma.—Head flat, broad; two concentric rows of teeth (the inner row palatine) in the upper jaw, and a single row only in the lower jaw; tongue free in front; operculum situated about halfway between the posterior edge of the rictus of the mouth and the fore leg; three opercular cartilages, between the posterior two of which is the aperture; feet fimbriated on their outer edge; toes four on the anterior feet, and five on the posterior; of the latter the fourth and fifth are webbed and without claws.

Example.—The only species known is *Menopoma Alleghaniensis,* Harl.; *Salamandrops Alleghaniensis,* Wagl. Length about two feet; head broad and flattened; mouth wide; nostrils projecting; body thick and stout; tail compressed vertically, and nearly as long as the body; legs stout and short; colour slaty, with dark spots on the body; a dark line runs through the eyes.

This is the Mud Devil, Ground Puppy, and Young Alligator of the Anglo-Americans.

It is found in the rivers Ohio and Alleghany. This batrachian is carnivorous and very voracious; nothing that it can devour is spared by it. The fishermen dread it very much, and believe it to be poisonous. Indeed the appearance of the animal is altogether uncouth and forbidding.

Sieboldtia.—Head large, trigono-ovate; rostrum produced, vertex convex; forehead concave; nostrils in the anterior margin of the maxilla, approximate; eyes very small, hardly distinguishable; no parotids; tongue not distinct; palatine teeth numerous; a crest on the anterior margin of the vomers; posterior feet with cutaneous appendages; toes small, free, with depressed cutaneous lateral lobes; tail rather round at the base, very much depressed in the middle and behind; head thickly covered with glands; body depressed, with transverse folds and a long thick cutaneous appendage on each side.

Example.—*Sieboldtia maxima.* This, which is the *Salamandra maxima* of Schlegel, was found by Dr. Von Sieboldt in a lake on a basaltic mountain in Japan. He brought away a male and a female; but the former devoured the latter during the passage, was afterwards kept alive at Leyden, was about a yard long, and fed on small fishes. The gill-aperture-slit always remains open in *Menopoma,* but in this great newt the slits are closed.

Triton.—Head rounded, convex; vertex somewhat flattened; tongue small, semi-globular, slightly free at each side, free and pointed behind; palatine teeth numerous, disposed in two rows; body granulous; no parotids; tail compressed, as long as the body; glandular pores behind and over the eyes, and a longitudinal row of distant similar pores along each side. Toes four on the anterior and five on the posterior feet. Crests of the back and tail (in the male) separate.

Example.—*Triton cristatus.* Blackish, orange-coloured beneath, sprinkled with round black spots; sides dotted with white; upper lip overhanging the lower, but not having a distinct lobe; body warty or tuberculated; tail rather smooth, compressed, sharp, trenchant above and below. Length six inches. Locality, north of Europe, and western and northern Asia.

This is the *Lacerta palustris,* of Linnæus; *Salamandra aquatica* of Ray; *Grosse Wasser-Salamander* and *Sumpfsalamander* of Bechstein; *Warty Lizard* of Pennant; *Common Warty Newt* and *Great Water-Newt* of the British.

Habits.—The ponds and ditches of this country abound with this the largest British Newt, and a most voracious animal it is. Aquatic insects, and indeed any small living animals which come in its way, are unsparingly devoured. It is a great destroyer of tadpoles, and the smaller Water-Newt, *Lissotriton punctatus,* frequently falls a victim to its ferocity and voracity. Mr. Bell has taken them more than once in the act of swallowing an individual of the smaller species, which was so large as to occasion great difficulty and delay in the act of deglutition. In swimming, the legs are turned backwards to lessen resistance, and the animal is propelled principally by the tail. Every one has observed the Newts, or Efts, as they are called in many places, floating motionless at the surface of the water, with their limbs extended at right angles with the body, and their toes spread out. Their progression at the bottom of the water and on land is performed creepingly with their small and weak feet.

The manner in which the female Triton deposits her eggs is very curious. The animal, selecting the leaf of some aquatic plant, sits as it were upon its edge; and folding it by means of her two hinder feet, deposits a single egg in the duplicature of the folded part of the leaf, which is thereby glued most securely together, and the egg is thus effectually protected from injury. Egg after egg is thus deposited, each in a separate receptacle. The manner in which this is effected may be observed by any one, as the animals are common in ponds and ditches. Both Spallanzani and Cuvier, from want of due precaution, erred respecting the mode in which the eggs of these animals are deposited. The subjoined figure represents the female of the *Triton cristatus* engaged in the task described.

Great Water Newt (*Triton cristatus*).

For a further account of the reproduction of the Tritons, and of the changes which take place in the tadpole from its exclusion from the egg to maturity, from its condition as a fish with branchial fringes for aquatic respiration, to the loss of these appendages and the acquisition of lungs and limbs, we refer to Rusconi ('Amours des Salamandres Aquatiques, et Developement du Tetard de ces Salamandres depuis l'Œuf jusqu'à l'Animal Parfait,' Milan, 1821), and also to Mr. Bell ('British Reptiles'). [FROG.]

Lissotriton, Bell.—Tongue, feet, and teeth, as in the genus *Triton;* skin smooth; two patches of pores on the head; none on the back or sides; dorsal and caudal crests continuous.

Example. — *Lissotriton punctatus* (*Lacerta aquatica*, Linn.). This is the Brown Lizard of Pennant, the Smooth Newt, and Small Newt, or Eft, of the English. In habits and manners this species agrees with those of the genus Triton, and the young undergo the same metamorphoses.

Salamandra.—Head thick; eyes large; gape of the mouth ample; tongue broad, palatine teeth arranged in two long series; parotids large; body sprinkled with many small glands; toes free; tail rather smooth.

Example. — *Salamandra maculosa*. Black, with yellow spots; numerous prominent warty excrescences on the sides; tongue very large; palatine teeth spatuliform; toes smooth.

This is the *Salamandra* of Gesner; *Salamandra terrestris* of Aldrovandus, Ray, and others; *Salamandre de Terre* of the French; and *Gefleckte Erd-Salamander* of the Germans. Locality, Central Europe and the mountainous parts of the south of Europe.

This land Salamander is, unlike the Tritons, ovoviviparous, though the young, at first, inhabit the water and undergo metamorphoses till they arrive at the mature state which fits them for living upon land, where they haunt cool and moist places, being not unfrequently found about fallen timber or old walls. The food principally consists of insects, worms, and small molluscous animals. In the winter it retires to some hollow tree or hole in an old wall, or even in the ground, where it coils itself up, and remains in a torpid state till the spring again calls it forth. As it increases in size, it constantly sheds its skin, which is moulted in flakes; at least such was the process in *Salamandra subviolacea*, observed by Dr. Barton.

The body of the Salamander is largely covered with warty glands. These secrete a milky fluid of a glutinous and acrid nature, like that of the toad, which, if not capable of affecting the larger and more highly organised animals, appears to be a destructive agent to some of those which are less highly organised. Thus Laurenti provoked two gray lizards to bite a salamander, which at first attempted to escape from them, but being still persecuted, ejected some of this fluid into their mouths; one of the lizards died instantly, and the other fell into convulsions for two minutes and then expired. Some of this juice was introduced into the mouth of another lizard; it became convulsed, was paralysed on the whole of one side, and soon died. According to Dr. Barton, this fluid, which the animal secretes in large quantities when irritated, and is then capable of ejecting to some distance, is not soluble in water, though it dissolves readily in spirits of wine. He found the taste of the juice of *Salamandra subviolacea* extremely acrid, resembling corrosive sublimate, and very astringent.

Anciently, and indeed until comparatively recent times, the Salamander was regarded with horror, as one of the most venomous of creatures; not only its bite produced death, but even the application of its saliva, and whatever fruit it crept over became impregnated with poison. It was deemed not only incapable of being consumed by fire, but even to possess the power of extinguishing flames. It is easy to discern from the short account which we have given of this animal, how these superstitions arose in the minds of the credulous and ignorant.

Fossil Salamandridæ.

Few fossils have awakened more curiosity than the *Homo Diluvii Testis* of Scheuchzer, who was unwearied in collecting organic remains, which he considered irrefragable evidence of the general deluge. At length he obtained from the Œningen beds (Miocene Period of Lyell) a fossil which he viewed with transport as the unequivocal remains of man himself. A short description of this specimen was published by him in the 'Philosophical Transactions' for 1726. He again brought forward this piece of 'good fortune' in his 'Physica Sacra,' where he tells us that previously he had only possessed two dorsal vertebræ. Of the humanity of his prize he certainly entertained no doubt.

He gives no bad figure of the fossil in tab. xlix. of the work last quoted, and when we look at that figure, it is difficult to conceive how such remains could have appeared to a physician, who must have had some acquaintance with osteology, to be those of man. We can only account for it by the blindness which an excited imagination and a determined adherence to

theory can produce. The iteration and determination of Scheuchzer had its effect, and naturalists adopted his opinions. Gesner (1758) appears to have been the first who threw deserved doubt on the alleged nature of the fossil; for though he quotes it as an anthropolite, he nevertheless, having become possessed of a similar specimen, offers his conjecture that it was a fossil fish (*Silurus glanis*, Linn.), and the obsequious naturalists were now as ready to follow him as they had been eager to run after Scheuchzer.

Gesner's specimen does not appear to have been engraved, nor another which was said to be in the convent of Augustins at Œningen; but a third specimen, more complete than Scheuchzer's, came into the possession of Dr. Ammann of Zürich, and is now in the British Museum. A figure of this was published by Karg, in the 'Memoirs of the Society of Naturalists of Suabia.'

Karg, after figuring Dr. Ammann's specimen, expressly stated that he had no doubt that the fossil was a *Silurus*, an opinion which Jäger refuted by placing by the side of the figure of the fossil, one of the skeleton of *Silurus glanis*.

These contradictory opinions were at once disposed of by Cuvier, who determined the nature of those fossil remains, and referred the *Andrias Scheuchzeri* to the present family.

SALAMANDROÏ'DES. Under this generic title Professor Jäger described a fossil reptile from the German Keuper, giving it the specific name of *giganteus*. This fossil now appears to be identical with *Mastodonsaurus* and *Phytosaurus*. Professor Owen therefore proposes to designate this gigantic genus of extinct Batrachians—for to that order he has satisfactorily shown that the form belongs—by the name of *Labyrinthodon* (from the extraordinary structure of its teeth). In his paper 'On the Teeth of Species of the Genus *Labyrinthodon* (*Mastodonsaurus*, *Salamandroïdes*, and *Phytosaurus* of Jäger) from the German Keuper and the sandstone of Warwick and Leamington,' he enters into details respecting the peculiar structure of the teeth of the Labyrinthodon. Of this paper an abstract is given in the 'Proceedings of the Geological Society of London' for 1841.

There are other interesting circumstances connected with this extinct reptile which require our notice; we allude to the presumed impression of its footsteps on sandstone. The study of Ichnology (Ἴχνος a footstep, λόγος a discourse) has recently excited great attention.

In 1828 Mr. Duncan's account of tracks and footmarks of animals impressed on sandstone in the quarry of Corn Cockle Muir, Dumfriesshire, appeared in the 'Transactions of the Royal Society of Edinburgh.' In 1831 Mr. G. Poulett Scrope found, after visiting the Dumfries quarries, minute undulations resembling the ripple-marks of water upon sand, together with numerous foot-tracks of small animals (crustaceans probably) on the strata of forest marble near Bath. The footsteps of the so-called *Chirotherium* of Hessberg and the *Ornithichnites* of Connecticut are among the most interesting of the discoveries in this department.

In Saxony, at the village of Hessberg near Hildburghausen, fossil footsteps were, a few years ago, discovered in several quarries of gray quartzose sandstone alternating with beds of red sandstone, nearly of the age of the red sandstone of Corn Cockle Muir. Dr. Hohnbaum and Professor Kaup state that those impressions of feet are partly concave and partly in relief; the depressions are described as being upon the upper surfaces of the sandstone slabs, but the footmarks in relief are only upon the lower surfaces, and cover the depressions. In short, the footmarks in relief are natural casts formed in the subjacent footsteps as in moulds. On one slab, six feet long by five feet wide, many footsteps of more than one animal and of various sizes occur. The larger impressions, which seem to be those of the hind foot, are generally eight inches in length and five in width, and one was twelve inches long. Near each large footstep, and at a regular distance (about an inch and a half) before it, a smaller print of a fore-foot, four inches long and three inches wide, occurs. The footsteps follow each other in pairs, each pair in the same line, at intervals of fourteen inches from pair to pair. The large as well as the small steps show the great toes alternately on the right and left side; each step makes the print of five toes, the first or great toe being bent inward like a thumb. Though the fore and hind foot differ so much in size, they are nearly similar in form.

The name of *Chirotherium* was proposed by Professor Kaup as the provisional name for the great unknown animal that impressed the larger footsteps, from a supposed resemblance in the marks of both the fore and hind feet to the impress made by a human hand.

In numerous localities in our own country have the footprints of the *Chirotherium* been discovered on slabs of sandstone, and thin beds of clay, the latter forming moulds filled by the sand which ultimately became converted into sandstone; with these footmarks occur ripple-marks, the prints and casts of rain drops, &c., from which the depth and direction of the current, and the point from which the wind was blowing at or about the time the animals were passing, may be calculated. On this subject the reader may consult Dr. Buckland's 'Address,' delivered at the Anniversary of the Geological Society of London on Feb. 21, 1840, and his 'Bridgewater Treatise.' It was reserved for Professor Owen to prove almost to a certainty the identity of the *Chirotherium* and the *Labyrinthodon*. The evidence adduced may be briefly stated as follows:—

1st. Proof from the skeleton that *Labyrinthodon* had hind extremities much larger than the anterior extremities.

2nd. That the footprints of *Chirotherium* are at least as much like those of certain toads as those of any other animals.

3rd. That the size of the known species of *Labyrinthodon* corresponds with the size of the footprints of the different species of *Chirotherium*.

4th. *Labyrinthodon* occurs in the new red-sandstone strata to which Chirotherian impressions are peculiar.

5th. No remains of animals that could have left such impressions as those of the *Chirotherium* have been found in these strata, except the remains of the Labyrinthodons.

SA'LAMIS, now Kolúri, is a small island adjacent to the coast of Attica. It forms the southern boundary of the Bay of Eleusis, and is only separated from the mainland, at the eastern and western extremities respectively, by a narrow winding channel. The bay is surrounded on the west, north, and east, by the high land of Attica, of which the northern shore of Salamis seems like a continuation, and thus the bay has the appearance of a large lake. The two channels have deep water, and a vessel may enter the Bay of Eleusis through them with any wind.

The form of the island is very irregular. On the west side it is indented by the deep Bay of Koluri, on which the village of Koluri stands, and on the east side a long narrow peninsula projects towards the coast of Attica. Its greatest length from north to south is about ten miles, and the longest line that can be drawn in the island, from about east to west, is a little more; but the area is probably not above 50 square miles. The soil, though scanty, is productive; and some districts are well suited to the olive. It produces good honey, and with proper care excellent wine might be made.

Salamis was one of the Attic demi from the time of Solon. In B.C. 480 was fought in the eastern strait of Salamis the great naval battle in which the fleet of Xerxes was defeated by the combined fleet of the Greeks.

SALAYER ISLANDS are a small group in the Indian Archipelago, situated between 5° 40′ and 6° 20′ S. lat., and between 120° and 121° E. long. The group consists of a larger and several smaller islands. The smaller islands are uninhabited, with the exception of two called Bonaratte and Calauwe. Salayer, or the principal island, is about 30 miles long, with an average width of eight miles; and it is divided from Cape Lassoa in Celebes by a strait about eight miles wide. Salayer contains many hills covered with trees; and the soil and climate are suitable for the growth of roots and grains common in the Indian Archipelago. The inhabitants, who are stated to amount to about 60,000, are Malays, are employed in agriculture, and in weaving coarse cotton stuffs. The island is divided among several petty princes, who are in some degree dependent on the Dutch at Macassar. On the eastern side of the island the Dutch have a small fort, or rather a redoubt, called Fort Defence.

SALE is a contract by which one man agrees to give to another money, and the other agrees to give something for the money, either a thing immoveable, as land, or a moveable thing, as merchandise. He who agrees to give the money is called the buyer; and he who agrees to take the money is called the seller. A sale may be made by the owner of the thing, or by a person who has his authority to make the contract. Sales of moveables made in market overt, or open market, are valid, though they are made by a person who has no title to the thing that is sold. When the price is agreed on between the buyer and the seller, and the thing to be sold is clearly ascertained, or so described as to be capable of being clearly ascertained, the contract of sale is complete. The delivery of the thing that is sold and the payment of the money are no part of the contract of sale; they are distinct transactions, by which the thing that was agreed to be done is accomplished. Some persons are in some cases restrained and in others disabled from buying and selling, but these restrictions and disabilities form no part of the law of sale; they belong to other branches of the law, such as infancy, bankruptcy, insolvency, coverture, lunacy, alienage.

Generally, all things may be the subject of sale; but there are some exceptions—such are a mere title to lands of which a party is not in possession, a presentation to a living actually vacant, the pay of a naval or military officer, and some other things.

Property is distributed under the two heads of real and personal property, which differ materially in many respects; and the modes of effecting the sale of each of these kinds of property likewise materially differ. Some incidents however are common to a sale both of real and personal property. No sale is valid unless

1st, The parties to it act with good faith.

2nd, Unless there is agreement or consent.

3rd, No sale is valid the subject of which is illegal, or which involves an illegal transaction, or has for its object an illegal act.

In the case of a sale of lands, it is assumed that the seller has a good title to them, and that he will deliver the title-deeds to the buyer, unless the written contract of sale, which is required by statute, shall vary these general terms. Otherwise, in failure of either of these particulars, the sale cannot be enforced. The right to receive a good title is one which is conferred upon the buyer by the law, independently of any agreement between the parties.

By the statute 29 Charles II., c. 3, s. 4, certain forms were required in order to give effect to a sale of 'lands, tenements, or hereditaments, or any interest in or concerning them.' But if an agreement for sale has been made without the requisite formalities, and has been carried into effect in some material part, a court of equity will enforce the performance of the whole contract. In all other cases of contracts as to interests in land, 'the agreement, or some memorandum or note thereof, shall be in writing, and signed by the party to be charged therewith, or by some other person thereunto by him lawfully authorised.' The agreement binds the party who signs it, although it is not signed by the other party. No established form is requisite, and it is not necessary that the agreement should be contained in one instrument: it may be collected from a series of letters, or a written offer followed by a written acceptance, or from documents referred to by a letter. An agent may be appointed verbally, and the same person may act as agent for both parties to the sale. An auctioneer is such agent, and his writing down the name of the highest bidder in his book is a sufficient signature.

When the contract for the sale of land is completed, the buyer is in equity viewed as the owner of the estate. It is a consequence of this equitable doctrine, that the buyer must, as a general rule, bear any loss which happens to the estate after the completion of the contract of sale.

With respect to sales of personal property, the common law required no formalities; and this is still so with respect to sales of moveables made at one time, and not together exceeding in price 10*l*. The 29 Charles II., c. 3, which prescribed certain formalities in sales of land, also enacted (s. 17) that 'no contract for the sale of any goods, wares, and merchandise for the price of 10*l*. sterling and upwards shall be allowed to be good except the buyer shall accept part of the goods so sold and actually receive the same, or give something in earnest to bind the bargain, or in part payment, or that some note or memorandum in writing of the said bargain be made and signed by the parties to be charged by such contract or their agents thereunto lawfully authorised.' By the 9 Geo. IV., c. 14, s. 7, the enactments of this act are extended to all contracts for the sale of goods of the value of 10*l*. sterling and upwards, notwithstanding the goods may be intended to be delivered at some future time, or may not at the time of the contract be actually made or fit for delivery. The statutory requisites are thus four in number:—

1. Delivery and receipt of part of the goods.
2. Payment of earnest.
3. Payment of part of the price.
4. A signature of a memorandum of the bargain by the party or his agent. By the performance of any one of these requisites the sale is complete.

1. If the goods are delivered to the buyer and accepted by him, no question can arise as to the completion of the bargain. A delivery which would be sufficient, if not afterwards interfered with by the seller, to accomplish the requisite of the statute, is complete as soon as the goods have been delivered to a carrier for the purpose of being conveyed to the buyer, even although the carrier has not been selected by the buyer. But during the course of actual transit to the place, indicated by the buyer to the seller as the place of destination, the goods are subject under certain circumstances to a right of the seller to detain them. This is called the right of stoppage in transitu, and the time and place when it ceases are often questions of great nicety.

The term Delivery, in the English law, which is the act of the seller, corresponds to acceptance, which is the act of the buyer; but the word Possession comprehends both, for if the buyer has obtained possession of the goods, the whole question of delivery and acceptance is settled. All the questions that occur in the English cases as to delivery and acceptance come under the general doctrine of possession. Whether the buyer has obtained possession or not, will depend on the facts, and the application to the facts of the general doctrine of possession. It has often been discussed whether the delivery of a thing sold is necessary to give the buyer the ownership of it. The question is one which is a matter for positive law; but it is most consistent with the nature of the contract to consider that the buyer does not obtain the ownership of the thing till he has obtained possession of it, even if the thing be a determinate thing which can be distinguished from all other things.

2. The Earnest-Money paid must be retained. In a case where a shilling had been paid to bind a bargain, and was returned, it was held that this was not a compliance with the requisite of the statute.

3. The Part Payment need not necessarily be made in cash; a payment by acceptance of a bill, or by a promissory note, will, while the instruments remain undishonoured, have the same effect as by actual money.

4. The general observations which have been made as to a Note or Memorandum in Writing relative to sales of land, will apply equally to one relative to sales of goods.

(Sugden, *On the Law of Vendors and Purchasers*; Ross's *Treatise on the Law of Vendors and Purchasers of Personal Property.*)

SALE, GEORGE, was born in 1680. Very little is known of his private life, except that he was a lawyer. He was a contributor to the 'Universal History,' edited by Swinton, Dr. Campbell, and others, and he wrote for that work the cosmogony, besides several valuable fragments of Oriental history. He was likewise one of the authors of the 'General Dictionary' (Lond., 1734, 10 vols. 4to.), which contains a translation of that of Bayle. But the work by which he is best known is a translation of the Korán into English, from the original Arabic. [KORAN.] Sale was one of the founders and a member of the first committee of a Society for the Encouragement of Learning, instituted in 1736. He died Nov. 14, 1736. Soon after his death, his Oriental MSS., containing many choice articles in Arabic, Persian, and Turkish literature, were purchased for the Radcliffe Library, Oxford.

SALEM. [MASSACHUSETTS.]

SALEP, *Salap*, or *Saloop*, a nutritious article of diet, much valued in the East for its supposed general stimulant properties, but which is justly esteemed as bland and nutritious, and well suited to children and convalescents. Salep consists of the tubers of different species of *Orchideæ*, which have been known in medicine from very early times by the name *Orchis*. Dr. Royle has treated of the plants yielding Salep, in his 'Illustrations of Himalayan Botany,' and in the 'Proceedings of the Royal Asiatic Society.'

Salep consists of the dried tubers of several orchideous plants, chiefly of the genus *Orchis*, as *O. moris*, *O. mascula*, *O. maculata*, &c., and from some species of *Eulophia*. All these plants have two tubers, charged with nutritious matter, and while one is nourishing the flower-stems and seeds of the current year, by which it is robbed of its store, the other serves as a reservoir for the flower-stem of the succeeding year. This last alone is fit for use. Both are dug up together, but the solid one only is retained. It is dipped in warm water, after which the fine brown skin is easily removed by means of a coarse cloth or brush. 'The tubers, being thus cleaned and peeled, are to be arranged on a tin plate, and then placed within an oven heated to the same degree as is necessary

for baking bread; here they are to remain for seven or ten minutes, in which time they will exchange their opaque and milky whiteness for a semi-transparent horn-like appearance, and a yellowish colour, retaining their original bulk. Being then withdrawn from the oven, they are exposed during some days to dry and harden in the air; or by the employment of a very gentle heat, they may be brought to the same state in the course of a few hours: all that is then required to adapt the salep for food is to boil it in water (or milk) to the required consistency.' ('Library of Entertaining Knowledge,' 'Vegetable Substances: Food of Man,' p. 159.)

SALE'RNO, properly *Principato-Citra*, a province of the kingdom of the Two Sicilies, lies between the Apennines and the coast of the Mediterranean, from the Gulf of Policastro to the Gulf of Salerno. The greatest length of the province is about 80 miles; its average breadth is about 30 miles. The area is 2261 square miles, and the population in 1845 was 537,606. The central and larger part of the province consists of the basin of the Sele, which carries the waters of the Rio Bianco (itself fed by the Rio Negro), the Pietra, and other rivers into the Gulf of Salerno.

The valley of the Rio Negro is bounded W. by a detached ridge called Monte Alburno, W. of which is the valley of the Pietra, which enters the Sele a few miles above its æstuary. The valley of the Pietra is bounded S.W. by another ridge, which rises E. of Pæstum. South of this ridge is a fine region of hills and valleys sloping towards the coast, and extending to the Gulf of Policastro. This tract of country, anciently called Pæstanæ Valles, is watered by the Alento, and is productive of all sorts of fruit; it also contains good pasture, and a thrifty population, who carry on a considerable coasting trade with Salerno and Naples. The town of *Policastro* was formerly of some importance, but being sacked and half destroyed by the Turks in the 16th century, it has never recovered, and is now an insignificant place. *Sapri*, which is farther east in the innermost recess of the Gulf of Policastro, is a place of some trade, and has a natural harbour. An offset of the central Apennines runs in a westward direction, dividing the province from Principato Ultra, and terminating in Cape Campanella at the extremity of the peninsula of Sorrento. On the southern slope of this peninsula, which is remarkably populous and healthy, are the towns of Vietri, La-Scala, Positano, AMALFI, and Majori. The province includes also a district north of this ridge, extending to the banks of the Sarno.

Salerno, the Roman *Salernum*, the capital of the province, and an archbishop's see, is a walled town of 12,000 inhabitants, finely situated on the sea-coast, and surrounded by a beautiful tract of country at the foot of the mountains. The harbour, sheltered by a mole, and defended by an old castle, is suited only for small vessels. Salerno has a royal lyceum, a provincial court of justice, a theatre, and many churches. The most remarkable building is the cathedral, built by Robert Guiscard, who adorned it with columns and a mosaic pavement from Pæstum. Among the modern buildings the palace of the intendente is handsome. The quay along the sea-shore is a fine promenade. An annual fair of both native and foreign goods is held at Salerno in September. The university of Salerno, one of the most ancient in Europe, and long the most celebrated for its school of medicine, still subsists, but its reputation is gone.

The other towns are—*La-Cava*, a town of 5000 inhabitants, and a bishop's see, situated in a valley on the road from Naples to Salerno. The population is chiefly employed in manufacturing linen, silk and cotton stuffs, and pottery. *Nocera-dei-Pagani*, 10 miles N.W. from Salerno, is an episcopal town of 7000 inhabitants. Its church of Santa-Maria-Maggiore is one of the most ancient in Italy, and resembles the Pantheon of Rome. Narses defeated the Goths under the walls of the town. The Saracens after the defeat of Pope John X. occupied Nocera for some time, and hence its surname of *dei Pagani*. *Sarno*, a considerable town in the plain of Campania, near the river of the same name, five miles north of Nocera, has several convents and churches, and about 10,000 inhabitants. *Eboli*, in a plain south-east of Salerno, is a poor town with about 5000 inhabitants. *Moliterno*, a town in the Apennines near the source of the Agri, has 6000 inhabitants, and gives the title of prince to a Neapolitan family.

SALES, SAINT FRANCIS DE, was born of noble parents, near Annecy in Savoy, Aug. 21, 1567. De Sales acquired the rudiments of learning at the colleges of La Roche and Annecy. In 1578 he was sent to Paris, and placed under the care of the Jesuits till 1584, when he was sent to Padua to study civil law under Guy Panciroli. He afterwards spent some time in Italy. On his return to his native country, he gave up great worldly advantages in order to devote himself to the ministry of the church. After receiving the first orders he was permitted by the bishop to preach. The greatest success attended his first efforts in pulpit oratory. In the fulfilment of his pastoral duties he was not less remarkable: he united the most untiring activity in visiting his flock and in relieving the wants of the sick and poor with an unaffected solicitude and evangelical patience. In 1594 De Sales, in conjunction with his relative, Louis, the canon of Geneva, undertook a mission to the ancient duchy of Chablais, for the purpose of converting the inhabitants from Calvinism, where their efforts were highly successful.

On the return of Francis to Annecy, in 1596, he was appointed coadjutor to Claude de Granier, the bishop of Geneva, with the title of Bishop of Nicopolis 'in partibus infidelium.' In 1602 he visited the court of France, where a course of Lent sermons, which he preached in the chapel of the Louvre, is said to have recalled several of the most influential of the Calvinistic nobility to a belief in their ancient faith. On his return to his native country the same year, he was appointed to the bishopric of Geneva. He prepared himself by a close retirement of twenty days at the castle of Sales for his consecration to this important office. In his new diocese he showed great zeal in reforming abuses among the clergy, in monas-

teries, and elsewhere. In 1606 he preached during Lent at Dijon, in France, where he was again successful in making several converts from Calvinism. On this occasion, likewise, he refused repeated offers of advancement from the French king, and also declined the proffered honour of a cardinal's hat from the pope, Leo XI. In 1610 De Sales founded a religious order for females, called the Order of the Visitation, and placed it under the superintendence of a pious lady, Madame de Chantal, sister of the Archbishop of Bourges. On the marriage of the sister of Louis XIII. of France, with the Prince of Piedmont, De Sales became her almoner. He preached for the last time on Christmas-Eve, 1622; the next day he was seized with a paralytic attack, under which he died, Dec. 28. In 1665 his memory was canonized by the pope, Alexander VII.

The best edition of his writings, which are not very numerous, is that of Paris, 1641, 2 vols. folio.

SALFORD. [MANCHESTER.]

SALIC LAW. [PHILIPPE V.]

SALICA'CEÆ, or *Saliciniæ*, a natural order of Apetalous Exogens. They are generally found inhabiting woods in the northern districts of Europe, Asia, and America. The most northern woody plant that is known, the *Salix arctica*, belongs to this order. There are only two genera in this order, *Salix* [SALIX] and *Populus;* but they are of great importance on account of their timber and various economical uses.

All the species of the genus *Populus* consist of deciduous trees, mostly of a large size, growing in Europe, North America, Asia, and the north of Africa. The poplar has long been valued as an ornamental tree, and the various species have been extensively cultivated in Europe.

Populus alba, the White Poplar, or Abele Tree, is a native of Great Britain, and most parts of Europe, in woods and thickets in a moist soil.

Populus canescens, the Gray Poplar, is by some writers considered only a variety of *P. alba*. It is of slower growth than *P. alba*, and the wood is finer, and more adapted for the purposes to which timber is applied. Not fewer than eight distinct varieties are enumerated as cultivated in our nurseries, and probably many more might be added to the list by a careful examination of collections of these plants. The White and Gray Poplar both attain a height from 80 to 100 feet. All their varieties grow exceedingly fast, sometimes attaining a height of 30 feet in ten years. The trees will endure for two centuries if allowed to remain; but if wanted for timber, they should be cut down before they are fifty years old, as after that period the heart-wood is liable to decay.

Populus tremula, the Trembling Poplar, or Aspen, is a native of moist woods in Great Britain, and in Scotland is found at an elevation of 1500 feet above the level of the sea. It is also found in the whole of the south of Europe, in the Caucasus, in Lapland, and is very abundant in Russia. The wood of this tree is used for much the same purposes as the last. Sheep and goats are said to be very fond of the leaves and bark.

Populus trepida, the American Aspen, is found in North America in extensive swamps from Canada to the Carolinas, and from Hudson's Bay to the northward of the Great Slave Lake. *P. grandidentata*, the Large American Aspen, is nearly allied to the above, and is probably only a variety of *P. tremula*. It attains a height of 40 or 50 feet, and is found in the same situations, but much less frequently than the foregoing. *P. Græca*, the Grecian Poplar, seems also to be a variety of the Aspen.

Populus nigra, the Black Poplar, is a native of Great Britain, and has a geographical range nearly the same as that of *P. alba*. It attains a height of from 70 to 80 feet, and, on account of its rapid growth, has been much cultivated.

Populus Canadensis, the Canadian Poplar, is an American species. It attains a height of 70 or 80 feet, and is found wild in the rocky districts of North America between Canada and Virginia. In America it is considered the best of all poplars for planting. The young shoots are used as food for horses. The poplar avenues in the garden at Versailles are formed of this tree.

Populus monilifera, the Black Italian Poplar, appears to have been introduced into England from North America. In America however it is called Italian Poplar, and in France *Peuplier Suisse*. It is probably a variety of an European species that has been introduced into America. It is the most rapid-growing of all the poplars, and in this country the timber is considered equal if not superior to that of any other species. In the neighbourhood of London, it has been known to grow 30 or 40 feet in height in seven years.

Populus fastigiata, the Lombardy Poplar, grows to the height of 100 and 120 feet, and sometimes 150 feet. It is a native of Italy on the banks of the Po, and also of Persia and the Himalayas. It was introduced from Italy into Britain about the year 1758, and is now very generally diffused, some parts of the country exhibiting magnificent specimens. The wood of the Lombardy Poplar is inferior to that of the Black Poplar and the Black Italian Poplar. But the great use of the tree in this country is in ornamental planting, and for this purpose its spiry straight form adapts it exceedingly well as a contrast to the round-headed trees that are so numerous.

Populus balsamifera, Balsam-bearing Poplar, or Tacamahac Tree, is a native of North America, Daüria, and the Altai, and attains a height of 80 feet. It is remarkable for its balsamic secretion, which was formerly collected in Canada in shells, and sent in considerable quantities to various parts of North America. In Siberia a tincture is prepared from the buds, which is said to be anti-scorbutic. But in Europe the principal use of the Tacamahac and its varieties, of which there are several from various districts, is in ornamental planting, for which it may be used instead of the Lombardy Poplar.

P. betulifolia, *heterophylla*, *angulata*, and *candicans*, American species, have also been cultivated in this country, and deserve a place in all collections of these plants.

SALICIN, a neutral principle obtained from several species of *Salix:* it is white, crystallises

in scales, inodorous, very bitter; fusible below 212°, and does not lose water at 392°. It is supposed by Piria to consist of C^{42} H^{24} O^{9}. In its crystalline state it contains two equivalents of water. Salicin possesses tonic properties analogous to those of disulphate of quina, and it is stated to be less liable to irritate the stomach. By various modes of treatment, it yields *Saliculous Acid*, *Saliculic Acid*, and *Saliculimide*.

SALICO'RNIA, the systematic name of the Glassworts, a genus of plants belonging to the natural order *Chenopodiaceæ*. They are mostly weeds inhabiting moist salt districts on the coasts of the North of Europe, Africa, and America. *S. herbacea*, Jointed Glasswort, is a common plant in the salt-marshes and on the banks of salt rivers in Great Britain. This, and many other species belonging to the genus, and to the other genera of the same natural family, yield a great quantity of soda, for the purpose of obtaining which they are collected on the coasts of the south of Europe and the north of Africa. This species is often eaten as a salad or pickle under the name of Samphire, but is a different plant from the true Samphire (*Crithmum maritimum*), which is found on the cliffs at Dover. The only other British species is *S. radicans*, which by some botanists is considered a variety of the last with a creeping stem.

SALIENT, a term applied to an angle which presents its point to the outside of the figure, as opposed to re-entering or re-entrant, which is applied to an angle presenting its point to the inside of the figure. These terms are frequently used in fortification, and seldom in geometry.

SALIE'RI, ANTONIO, was born at Legnano, in the Venetian territory, in 1750. He studied music under Giovanni Pescetti and Leopold Gasmann. The latter took his pupil to Vienna, where he made the acquaintance of Glück, who entrusted Salieri with the charge of composing 'Les Danaïdes,' which Glück had engaged to produce for the Académie Royale de Musique. This work met with the most brilliant success in Paris, and Salieri afterwards brought out many operas, among which his 'Tarare' and 'La Grotta di Trofonio' were the most popular. He died at Vienna, in 1823.

SALIFEROUS SYSTEM. In geology, the series of calcareous, argillaceous, and sandy strata, locally and frequently productive of rock-salt or brine-springs, and of gypsum, is thus designated. Salt is abundantly but not exclusively found in this system of deposits. Springs more or less salt are indeed met with in a great proportion of the whole series of strata.

Salt shows itself in the Cheshire mines as either granular, broadly laminated, or fibrous, in great beds or minutely mixed with marls, the solid beds (of limited extent however and irregular area) being due to a great evaporation of liquid over the previously-deposited marls. That such water, in the case of rock-salt generally, was derived from the sea, is almost certain, from the occurrence of iodine and bromine in the brine-springs connected with them.

It is not known that organic remains of any kind accompany the salt of Cheshire. In the Saliferous System the red strata extend through several hundred feet of thickness, and it is found that the types of organic life above and below are widely different. M. Adolphe Brongniart ('Prodrome d'une Histoire des Végétaux Fossiles,' 1829), viewing the series of fossil plants, gives four great periods of ancient vegetation:—the first extending from the earliest strata to the red-sandstone (saliferous) strata; the second including these strata; the third including the oolites and chalk; the fourth, the tertiary strata. Of these the flora of the second period (chiefly terrestrial) is very limited, and may be looked upon as a transition group of plants connecting the earlier and later periods. Similarly the series of marine invertebrata which lie in the Saliferous System have characters intermediate between the early (palæozoic) and later races of preadamitic life. The saliferous period includes two formations. [Magnesian Limestone; Red Sandstone.]

SALINA. [New York.]

SALI'NAS, FRANCISCUS, was born in 1613, at Burgos, the capital of Old Castile. Blind from his birth, he had recourse to the study of music, and became a superior organist. While yet a boy he was instructed in Latin by a young woman, and his success in acquiring it led to his being entered at the university of Salamanca. Here he applied assiduously to the Greek language, as well as to philosophy, and commenced reading the Greek authors on the science of music, with whose writings he made himself thoroughly acquainted, commenting on them in an equally learned and ingenious manner in his great work, 'De Musica,' &c., a treatise in seven books, published at Salamanca in 1677. Pope Paul IV. created him abbot of St. Pancratio, in the kingdom of Naples. Salinas died, according to Thuanus, in 1690. A full and clear analysis of his work is given by Sir John Hawkins ('History of Music,' iii. 123); to which Dr. Burney has made some interesting additions.

SALINS. [Jura.]

SALISBU'RIA, a genus of the natural family of *Taxaceæ*. The tree, which is the only one of the genus, has long been known by the Japanese name Gingko. It grows naturally in Japan, is much cultivated in China, and is found in many gardens in Europe. Fine old specimens may be seen at Kew and in the Apothecaries' Garden at Chelsea.

SALISBURY, a city, parliamentary borough, and municipal borough, in Wiltshire, 96 miles W.S.W. from London, by the Salisbury branch of the South Western Railway, and 23 miles W. from Winchester.

This city had its origin in the 13th century. The bishop and canons of the cathedral, which was then within the fortifications of Old Sarum [Sarum], being exposed to injury from the captains of that fortress, with whom they were at feud, determined to remove their church to another site; and Herbert Pauper or Poore, who held the see, having obtained an indulgence from the pope, determined on commencing a new church on the lands belonging to the see on the site of the present cathedral (A.D. 1220). The inhabitants of

Old Sarum being attached to their bishop and clergy, determined on removing also, and thus the city of New Sarum, or Salisbury, rose into existence. A charter granted by Henry III., making it a free city, and giving to the inhabitants a fair and a market, contributed to its prosperity, and in the succeeding reigns several parliaments were held there. It was fortified by a wall and ditch; and the erection of a bridge over the Avon at Harnham brought the great western road (which had previously passed through Old Sarum) through this town.

The city is situated on the eastern bank of the river Avon, and the principal part of it lies immediately to the north of the extensive Cathedral Close. It consists of several streets regularly laid out at right angles to each other. Most of the houses are of brick, of comparatively modern erection, and several of them of handsome appearance. The principal streets have a stream of water conducted through them by canals lined with brick. Fisherton Anger, a village now included in the parliamentary boundary, is on the western side of the Avon, and is connected with the city by a bridge. South of the Avon, where it makes a bend to the east, is the suburban village of Harnham.

The cathedral is considered one of the most beautiful in England. The Close is entered by several ancient gates. The freedom of the cathedral from the encumbrance of contiguous buildings adds much to the imposing beauty of its appearance. The church consists of a nave and choir with two side aisles, a space on the east of the choir, and a Lady-Chapel at the east end; a large transept with an aisle on its east side; a smaller transept east of the former, with an aisle on its east side; a central tower and spire 404 feet high; a north porch, a muniment-room or vestry at the south end of the eastern transept; cloisters, and a very beautiful chapter-house.

This edifice has the advantage of being built in one style, the Early English, and from a uniform plan. The tower and spire are of later date, but admirably accommodated to the style of the building. The three parish churches of the old city are large; St. Edmund's and St. Thomas's are fine buildings of perpendicular style.

The other public buildings are the council-house, erected 1795; the spacious county gaol and bridewell, erected 1818; the infirmary, a plain and commodious building; the Salisbury and Wiltshire library and news-room, with a small museum annexed to it; a small theatre; and several dissenting meeting-houses and alms-houses.

The manufacture of woollen and cutlery once extensively carried on here have now much declined; but the silk manufacture has been introduced with some success. The municipal government consists of a mayor, 6 aldermen, and 18 councillors, having a commission of the peace. The borough returns two members to parliament: population, in 1841, 11,626. Population of the city, 10,086.

SALIVA, SALIVARY GLANDS. The principal glands by which the saliva is secreted are six in number, three being situated on each side of the face, viz. the parotid, the submaxillary, and the sublingual glands.

The saliva which is secreted by these glands, according to the general laws of secretion, is, when not mixed with air, a transparent rather viscid fluid, which is usually weakly alkaline, but during the mastication of food is often slightly acid. It is composed of a great proportion of water, mixed with portions of the epithelium of the mucous membrane lining the mouth, and holding in solution about seven parts in one thousand of albumen, salivine (a principle almost peculiar to itself), and other animal matters, together with the saline substances found in the blood, and a very minute quantity of sulphocyanide of potassium.

The purpose served by the saliva seems to be the softening of the food, with which it is intimately mixed in mastication. The quantity secreted when the mouth is at rest is only sufficient to keep its internal membrane moist and slippery. When however the jaws are actively moved, and especially during feeding, or even at the thought of a meal or of certain kinds of palatable food, the quantity is greatly increased.

SALIVATION, or PTYALISM, is a superabundant secretion of saliva. This sometimes occurs as an idiopathic disease, originating without any evident cause. But far more frequently salivation is the effect of medicines or poisons. Some preparations of gold, copper, antimony, and iodine, croton oil, digitalis, and even opium, are apt to produce it; and it is almost a constant effect of the long-continued or copious administration of mercury.

The quantity of mercury required to produce salivation varies greatly in different persons. In some, two or three grains of calomel are sufficient; but by other persons such large quantities may be taken with impunity that they appear insusceptible of its action.

The best treatment of mercurial salivation is exposure to cool pure air, a nutritious diet, and mild purgatives. Gargles of chloride of soda are useful in correcting the fœtor of the breath; and honey, or the *Mel Boracis*, may be applied to the smaller ulcers in the mouth.

SALIX, the name of a genus of plants, which, in conjunction with *Populus*, constitutes the natural order *Salicaceæ*. In many respects this is one of the most important genera of plants: the rapidity of their growth, the toughness and lightness of their wood, and their uses in medicine and the arts, have caused them to be extensively cultivated.

The Willows are chiefly natives of the colder parts of the temperate regions of the northern hemisphere. *S. herbacea* and *S. arctica* are found nearer the pole than any other woody plants. *S. Babylonica* is a native of China, Japan, Armenia, and the north of Africa. Of all the species enumerated, only 17 are extra-European.

Willows are extensively cultivated in this country as timber-trees, coppice-wood, and for the purpose of making hoops and basket-work. All willows that are intended for basket-rods, hoops,

poles, or timber-trees, should annually ripen their shoots. Hence the colder the climate, the drier should be the soil in which they are planted, on account of the necessity of ripening their wood. The willow grows naturally in a moist soil, and, wherever planted, it should be within reach of water.

In the culture of the willow as osiers and for hoops, great care is required in order to produce them in perfection. All willows may be propagated by cuttings.

All the willows are liable to the attacks of various insects, and on that account afford a valuable field for entomological research. The larvæ of *Cossus ligniperda*, *Cerambyx moschatus*, and *Nitidula grisea*, are found in the wood of most willows, on which they feed, and in general they are so numerous as to destroy the tree in a few years. *Cryptorhynchus lapathi* is an insect which frequently commits great havoc in osier-grounds.

There are at present described about 220 species of *Salix*. The more common species may be arranged under the heads *Sallows*, *Osiers*, and *Willows*.

The *Sallows* are trees or low shrubs, and are characterised by downy branches, and mostly obovate, gray, hoary, toothed, more or less wrinkled, and stipuled leaves, very veiny beneath. *Salix cinerea*, the Gray Sallow, is abundant in England on banks of rivers and in moist woods. *Salix aquatica*, Water Sallow, is also a British species. *Salix caprea*, Goat Willow, is a native of Britain, and is distinguished early in the spring by putting forth its handsome yellow blossoms before other trees have assumed their foliage. The bark is used for tanning, and the wood is employed for making implements of husbandry. It is also grown for hoop-making, and in medicine the bark is sometimes used as a substitute for cinchona.

The *Osiers* are trees of a more or less considerable size, with long pliant branches and lanceolate leaves; ovaries nearly sessile, hairy or silky; their styles elongated; their stigmas linear, mostly entire. Any willow however that has long pliant twiggy branches and is grown on this account is called an Osier. *Salix viminalis*, Common Osier, is the species that is used for the various kinds of basket-work, bands, &c., and for this purpose is largely cultivated in this country. *Salix stipularis*, Auricled Osier, is a native of England, and may be employed for the same purposes as *S. viminalis*, but is inferior to that species. *Salix incana*, Hoary Osier, is found wild in the lower Alpine valleys, on the Pyrenees, Cevennes, Alps of Dauphiny, Switzerland, Tyrol, Austria, and Carpathia. Its distinct character renders it an interesting species to the botanist.

The *Willows* include a few species which are useful in the arts and medicine. *Salix Russelliana*, Russell or Bedford Willow, is a native of Britain, growing in marshy woods, osier-grounds, &c. This tree was first brought into notice by the late Duke of Bedford. *Salix alba*, Common White Willow, grows in most countries of Europe, and is more extensively planted as a timber-tree than any other species. It grows rapidly, attaining a height of 30 feet in 10 or 12 years. Hundreds of miles of road between Moscow and the Austrian frontier are planted with this tree. The bark is used in the north of Europe both for tanning and dyeing. The wood is very useful, and is employed for making the handles of all sorts of instruments, in turnery, millwork, coopery, weather-boarding, &c. Willow hats and bonnets are made from the shavings of this willow. The bark may be used in medicine instead of *S. Russelliana*, but it is not so valuable. It is frequently called the Huntingdon Willow, and under that name is recommended by Gilpin and others as an ornamental tree. *Salix Babylonica*, the Weeping Willow, is the most favourite species of the genus. It is a native of Asia, on the banks of the Euphrates near Babylon, whence its name; also of China, of Egypt, and other parts of North Africa. It is said that this willow was introduced into England by the poet Pope, who, being with Lady Suffolk when she received a parcel from Spain bound with withes, which appeared alive, took one, and planted it in his garden, which grew up, and afterwards became so well known as Pope's Willow at Twickenham. It is however more probable that it was introduced by the botanist Tournefort into Europe. This tree is increasingly cultivated in this country and on the Continent. It is one of the greatest favourites in China, as might be inferred from its constant introduction into Chinese pictures. Growing on the banks of its native Euphrates, it was the willow on which the weeping daughters of Zion 'hanged their harps.' (Psalms, cxxxvii.) *Salix pentandra*, Sweet Bay-Leaved Willow, yields a sweet scent, and its bark is preferred as a medicine to that of any other species, on account of its aroma.

SALLU'STIUS, or SALU'STIUS, with his full name C. SALLUSTIUS CRISPUS, was born B.C. 86, at Amiternum, a town in the country of the Sabines, of a plebeian family. He received instruction from the grammarian Atteius Philólogus, who is said to have supplied him with an epitome of Roman history. He was tribune of the plebs, B.C. 52, in which year Clodius was killed by Milo. Sallust was a strong opponent of the aristocratical party, and in his tribuneship took an active part in the proceedings against Milo. In B.C. 50, he was expelled from the senate by the censors Appius Claudius and Piso, in consequence, it is said, of his immoral life; but there is no good authority for this statement of the grounds of his expulsion, and we know that Appius Claudius belonged to the Pompeian party, and that Sallust only shared the fate of Cæsar's friends. Sallust was prætor in B.C. 47, and was present at the mutiny of Cæsar's troops in Campania, on which occasion he narrowly escaped with his life. He accompanied Cæsar the same year into Africa, where he was actively employed in the war, and when Cæsar quitted Africa in B.C. 46, he left Sallust governor of the province, where, according to Dion Cassius, he acquired immense wealth by the plunder of the country. On his return home, Sallust built his famous palace at Rome, which

was afterwards used by the emperors. He died B.C. 34.

The moral character of Sallust has been drawn in the darkest colours by many writers. These accusations however do not rest upon sufficient authority, unless we except the tale told by Varro, that Sallust was detected in adultery with Milo's wife, and severely punished by the husband.

Sallust wrote a history of Catiline's conspiracy, and of the war with Jugurtha, and also a general history of Roman affairs from the death of Sulla, B.C. 78, to the appointment of Pompeius to the command of the Mithridatic war, B.C. 67. The two first works have come down to us entire; but of the latter we have only fragments.

In estimating the value of Sallust's writings, it should be borne in mind that the Romans possessed no works worthy of the name of histories before his time. Preceding writers merely narrated events according to the order of the years in which they happened, without any attempt to trace the causes and results of the events which they recorded. Sallust studiously avoided the annalistic style of his predecessors, and appears to have made Thucydides his model. The fastidious critics of the Augustan age objected to the use of the antiquated expressions which Sallust sometimes employed, but it is no small proof of the excellence of Sallust's style that Tacitus closely imitated it.

Two epistles have come down to us under the name of Sallust, addressed to Julius Cæsar, on the management of the state ('De Republicâ Ordinandâ'); but they are evidently not the work of Sallust. There is also extant a declamation against Cicero, falsely ascribed to Sallust.

The first edition of Sallust was published at Venice, in 1470. The edition of Cortius, which was published at Leipzig, in 1724, 4to., with a valuable commentary, has formed the basis of most of the subsequent editions. The best modern editions are those of Kritz, 2 vols. 8vo, Leipzig, 1828, 1834, and of Gerlach, Basel, 1823–1831, 3 vols. 4to. There are translations of Sallust into English by Gordon, Lond., 1769, 4to.; by Rose, 1757, 8vo.; and by Sir Henry Stewart, 2 vols. 4to.; in French, by De Brosses.

SALLUSTIUS, a Platonic philosopher, who lived in the fourth century of the Christian æra. He wrote a work in Greek, 'On the Gods and the World,' which was originally published by Leo Allatius, Rome, 1638, 12mo. The best edition of this work is by Orelli, Zürich, 1821, 8vo. It has been translated into French by Formey, Berl., 1748, 8vo, and into German, by Schulthess, Zürich, 1779, 8vo.

SALMA'SIUS, CLAU'DIUS, the Latinised form of his real name CLAUDE DE SAUMAISE, was born near Sémur in Auxois, in the year 1588 or 1596; more probably the latter. Salmasius was educated at home by his father, and is said to have made such progress as to be able to read Pindar at ten years of age. At the age of sixteen he was sent to Paris to prosecute his studies, where he became acquainted with Casaubon, by whose influence he was induced to embrace the Reformed faith. From Paris he went to Heidelberg, where he made a formal renunciation of the Roman Catholic religion. At Heidelberg he obtained the friendship of the jurist Denys Godefroy and of Gruter. During his stay in this city, he prosecuted his studies with the greatest perseverance. He published an edition of Florus, Paris, 1609, 8vo. After spending three years in Germany, he returned to France, and shortly after his return published a short treatise 'De Suburbicariis Regionibus et Ecclesiis.' In 1620 he published his edition of the 'Historiæ Augustæ Scriptores Sex,' folio, with a valuable commentary. In 1622 Salmasius published his edition of Tertullian's work 'De Pallio,' with a commentary, in which he treats at great length of the different garments worn by the ancients.

In the following year (1623) Salmasius married the daughter of Mercier, who was a person of high rank, and from the time of his marriage Salmasius resided for many years in the neighbourhood of Paris, chiefly engaged in the preparation of his great work, which was published at Paris in 1629, 2 vols. folio, under the title of 'Plinianæ Exercitationes in Caii Julii Solini Polyhistora,' and reprinted at Leyden in 1689. It is a work of astonishing erudition; not only does it embrace questions connected with Greek and Roman history, geography, and archæology, but it also treats at great length of the plants, herbs, and minerals known to the ancients. In this, as well as in most of his other writings, Salmasius often shows great carelessness in the statement of facts, combined with much arrogance. He settled at Leyden in 1632, where he received a public salary, but did not discharge any duties as professor. Upon the death of his father in 1640, Salmasius returned to France to settle his father's affairs; and though he received flattering offers from Richelieu and afterwards from Mazarin, he returned to Leyden, where he remained till 1650, when he went to Sweden to pay a visit to Queen Christina, who had sent him the most pressing invitation. The climate of Sweden however did not agree with him, and he returned in the following year.

After the death of Charles I. of England, Salmasius was employed by Charles II., who was then in Holland, to write a defence of his father and of monarchy, which he accordingly did, and published under the title of 'Defensio Regia pro Carolo I.,' 1649; to which Milton replied in his 'Defensio pro Populo Anglicano.' Salmasius prepared a reply to Milton, but did not live to finish it. He died in September, 1653.

Salmasius also wrote and edited the following works:—'De Usuris,' Leyd., 1638, 8vo.; 'De Modo Usurarum,' Leyd., 1639, 8vo.; 'Dissertatio de Fœnere Trapezitico, in tres libros divisa,' Leyd., 1640; 'Notæ in Pervigilium Veneris,' Leyd., 1638, 12mo.; 'Commentarius in Simplicii Enchiridion Epicteti,' Leyd., 1640, 4to.; 'Interpretatio Hippocratei Aphorismi de Calculo,' Leyd., 1640, 8vo.; 'De Hellenisticâ Commentarius Controversiam de Linguâ Hellenisticâ decidens, et plenissime pertractans Origines et Dialectos Græcæ Linguæ,' Leyd., 1645, 8vo.; 'Observationes in Jus Atticum et Romanum,' Leyd., 1645, 8vo.

SALMON. [SALMONIDÆ.]

SALMON FISHERY. [FISHERIES.]

SALMO'NIDÆ (Salmon Tribe), a family of fishes belonging to the *Malacopterygii Abdominales*. These fishes have the body covered with scales, the first dorsal fin has soft rays only, and the second dorsal is small and destitute of rays, and of a soft fleshy nature. They are furnished with an air-bladder, and have numerous cæca. The more typical species appear to be confined to the northern hemisphere.

The genus *Salmo*, as at present restricted, contains those species, such as the salmon and trout, in which the upper boundary of the mouth is formed chiefly by the superior maxillary bones, the intermaxillaries being small, confined to the fore-part, and situated between the maxillaries; usually these latter bones descend in front of the superior maxillaries, and form the upper boundary of the mouth. The maxillary bones, intermaxillaries, palatines, vomer, and even the tongue, are furnished with teeth. The branchiostegous rays are about ten in number. The air-bladder extends the whole length of the abdomen.

Numerous species of this genus are found in the seas of the northern hemisphere, one of the largest of which is the common salmon (*Salmo salar*, Linn.), a fish too well known both in flavour and appearance to require any particular description. This fish, Cuvier states, is found in all the Arctic seas, whence it enters the rivers in the spring. Mr. Yarrell observes that fishes ascend the rivers in some situations much earlier than others, which depends on the time of their attaining the breeding condition. Rivers issuing from large lakes afford early salmon, the waters having been purified by deposition in the lakes; on the other hand, rivers swollen by melting snows in the spring months are later in their season of producing fish, and yield their supply when the lake rivers are beginning to fail. 'The causes influencing this,' says Sir William Jardine, 'seem yet undecided; and where the time varies much in the neighbouring rivers of the same district, they are of less easy solution. The northern rivers, with little exception, are however the earliest, a fact well known in the London markets; and going still farther north, the range of the season and of spawning may be influenced by the latitude.' Artedi says that in Sweden the salmon spawn in the middle of summer. From some further observations in Mr. Yarrell's excellent work, it appears that the temperature of the water has considerable influence.

'The fish having at length gained the upper and shallow pools of the river, preparatory to the important operation of depositing the spawn in the gravelly beds, its colour will be found to have undergone considerable alteration during the residence in fresh water. The male becomes marked in the cheeks with orange-coloured stripes, which give it the appearance of the cheek of a *Labrus;* the lower jaw elongates, and a cartilaginous projection turns upwards from the point, which, when the jaws are closed, occupies a deep cavity between the intermaxillary bones of the upper jaw; the body partakes of the golden orange tinge, and the salmon in this state is called a Red Fish. The females are dark in colour, and are as commonly called Black-Fish; and by these terms both are designated in those local and precautionary regulations intended for the protection and preservation of the breeding fish.'

Preparatory to the process of spawning, the male and female salmon, working against the stream, plough up by means of their snout a furrow in the gravel, and in this furrow the spawn is deposited. After this operation the fish becomes out of condition and unfit for food.

Mr. Yarrell describes thirteen British species of the family *Salmonidæ*. See Yarrell's 'British Fishes;' Ellis's 'Memoir on the Natural History of the Salmon;' and some valuable papers by Mr. John Shaw, of Drumlanrig, Dumfriesshire.

Mr. Shaw's first paper, entitled 'An Account of some Experiments and Observations on the Parr, and on the Ova of the Salmon, proving the Parr to be the Young of the Salmon,' will be found in the 'Edinburgh New Philosophical Journal' for July, 1836, vol. xxi. His second paper, in which he gives an account of 'Experiments on the Development and Growth of the Fry of the Salmon, from the Exclusion of the Ovum to the Age of Six Months,' is published in the same work, vol. xxiv., p. 165; and lastly, in the 'Transactions of the Royal Society of Edinburgh,' vol. xiv., p. 547, the author gives a summary of the preceding papers, and adds the result of further investigations.

A paper by Sir W. Jardine, Bart., proving the distinctness of the parr from the young salmon, will be found in the 'Edinburgh New Philosophical Journal' for January, 1835.

The following genera are placed by Cuvier under the *Salmonidæ:—Salmo, Osmerus* (Smelt), *Mallotus, Thymallus* (Grayling), *Coregonus* (Guyniad and Vendace), *Argentina, Curimata, Anastomus, Serpes, Scopelus* (Argentine), and several others. ('Règne Animal,' vol. ii. p. 301, et seq.)

SALOMON, JOHANN-PETER, was born at Bonn, in 1745, and educated for the civil law; but, having a strong propensity for music he studied that in preference, and soon became celebrated, not only for his performance on the violin, but for his knowledge of the harmonic art in all its branches. When young he entered the service of Prince Henry of Prussia, at Berlin. For this prince he composed several French operas. He afterwards accepted an invitation to Paris in 1781, where he met with praise, but speedily sought the English shores, where he found friends and patrons of a more useful description. In 1790 he formed the project of giving a series of subscription-concerts in London, and carried it into effect in the following year. These constitute an epoch in musical history, for they led to the production of those twelve grand symphonies by Haydn, known everywhere as 'composed for Salomon's Concerts.'

In 1798 the oratorio of 'The Creation' was produced at the Opera concert-room, at the risk and under the direction of Mr. Salomon. In 1801 he, in conjunction with Dr. Arnold and Madame Mara, opened the Haymarket theatre,

during Lent, with oratorios; and in the same year gave five subscription-concerts. He shortly afterwards retired from public life, and chiefly occupied his time in attending at Carlton House, in composing two sets of canzonets, some songs, glees, &c., together with six violin solos and two grand violin concertos, arranged for the pianoforte. He died in 1815.

SALON. [Bouches-du-Rhône.]

SALOON (from the Italian *sala* and its augmentative *salone*) signifies, in its stricter architectural meaning, a room answering in some respect to the idea of a hall, that is, not only the principal room as to spaciousness, but loftiness also. At present however the name of saloon is indiscriminately bestowed on any unusually large room, be its proportions and character what they may.

SALPA'CEA. Lamarck places the genus *Salpa* in his third section of *Tunicata* (*Tuniciers Libres ou Ascidiens*), with the following definition: 'Animals disunited, either isolated or assembled in groups, without internal communication, and not forming essentially a common mass.' These form his second order of *Tunicata*, with the title above given, and consist of the genera *Salpa*, *Ascidia*, *Bipapillaria*, and *Mammaria*. *Pyrosoma* is arranged under his second section: 'Animals floating with their common mass in the bosom of the waters,' in his first order (*Tuniciers Réunis ou Botryllaires*).

M. de Blainville ('Malacologie') makes the *Salpacea* the second family of his fourth order *Heterobranchiata*, with the following character:—

Body free, or not adherent, more or less cylindrical, with a thick external envelope, which is subcartilaginous, transparent, pierced with two apertures, which are ordinarily very large and distant, nearly terminal, one incrementitial, the other excrementitial. The branchiæ, in the form of a narrow band, traverse obliquely the respiratory cavity of the incrementitial orifice to the aperture of the mouth.

The following is Cuvier's description of *Salpa*; but we should premise that he places this genus in the first family of his *Acéphales sans Coquilles* (the second order of his Acephalous Mollusks), and *Pyrosoma* in the second family, *Les Aggrégés*.

The *Biphores* (*Thalia*, Brown; *Salpa* et *Dagysa*, Gm.) have, says Cuvier, the mantle and its cartilaginous envelope oval or cylindrical, and open at both ends. On the side of the anus the aperture is transverse, wide, and furnished with a valvule, which permits the entrance but not the departure of the water; on the side of the mouth it is simply tubular. Muscular bands embrace the mantle and contract the body. The animal moves in making the water enter at the posterior aperture, which has the valvule, and in forcing it to go out by that on the side of the mouth, so that it is always pushed backwards, which caused many naturalists, Chamisso and others, to take the posterior aperture for the true mouth; but it is evident that it is no reason for changing the denominations of these parts because an animal swims on its back (which the *Biphores* generally do) with the head behind. Thus it was that the organisation of the *Pterotracheæ* (which always swim with the back downwards, as is the case with an infinity of Gastropods with and without shells) was mistaken. The branchiæ form a single tube or riband furnished with regular vessels, placed scarfwise in the middle of the tubular cavity of the mantle, so that the water strikes it incessantly in traversing the cavity. The heart, the viscera, and the liver are knotted into a nucleus near the mouth and on the side of the back; but the position of the ovary varies. The mantle and its envelope sparkle in the sun with iridescent colours, and are so transparent that one sees through them the anatomy of the animal; in many species they are provided with perforated tubercles. The animal has been sometimes seen to go out of its envelope without appearing to suffer. But one of the most curious phenomena attending the *Biphores* is that during a long time they remain united together, as if they were in the ovary, and thus swim in long chains, where the individuals are disposed in different orders, but always in the same order in each particular species. M. de Chamisso declares that he has proved a fact still more singular, namely, that individuals which have thus come forth from a multiple ovary have not a similar one, but produce only isolated individuals differing in form, which in their turn yield ovaries similar to that from which their mother came forth, so that there is alternately a less numerous generation of isolated individuals, and a numerous generation of aggregated individuals. These alternate generations do not resemble each other. It is certain, continues Cuvier, that one observes in some species small individuals adhering in the interior of great ones by a sort of peculiar sucker, and of a different form from those which contain them. He adds that these animals are found abundantly in the Mediterranean and the warm parts of the ocean, and that they are often endowed with phosphorescence. ('Règne Animal.')

A very interesting account of the luminosity of the ocean produced by vast shoals of a species of *Pyrosoma* is given by Mr. George Bennett in the first volume of his 'Wanderings in New South Wales,' &c., p. 41, et seq.

SALSETTE, an island in the Indian Ocean, close to the west coast of Hindustan, and included in the British presidency of Bombay. It is a little to the north of the island of Bombay, with which it is united by a causeway. Salsette extends from 19° 4′ to 19° 17′ N. lat., and from 72° 50′ to 73° 2′ E. long., with an average length of about 16 miles and an average breadth of about 10 miles. Its area is about 160 square miles.

The island consists for the most part of rocky hills, in some parts of considerable elevation, but covered with underwood to their tops; the jungle in many parts being very thick, while in the valleys there are groves of mangoes and palms, and some fine timber-trees. There are tigers in the jungle, and great numbers of monkeys and jungle-fowl. 'The island is said to be fertile, and capable of much improvement, but little has been done for it by the British government, with the exception of an excellent road which has been made round it. *Tannah* and *Gorabunder* are the only towns. The latter is little better than a

poor village, but Tannah is a neat and flourishing town on the eastern coast of the island, chiefly inhabited by descendants of Portuguese and by Hindoos. The Portuguese are Roman Catholics, and have converted a great number of the Hindoos, at the same time that they themselves have adopted most of the habits of the Hindoos, and have become almost as dark-coloured. There is a small but regular fortress, and a considerable cantonment of British troops at Tannah. A wild race of people inhabit the hills, who are charcoal-burners. They have no intercourse with the Hindoos, who inhabit the lower grounds, but bring down their charcoal to particular spots, whence it is carried away by the Hindoos, who deposit in its place a settled payment of rice, clothing, iron tools, or other necessaries.

The chief objects of curiosity in Salsette are the temple caves of Kennery, which resemble those of Elephanta, and Carlee. [ELEPHANTA; POONAH.] They are numerous, but for the most part small, cut in two of the sides of a hill, at different heights, and of various forms. Some of the smaller ones seem as if they had been the residences of monks or hermits. The largest cave is a Buddhist temple, a rectangle about 50 feet long by 20 wide, terminated by a semicircle. The entrance is formed by a lofty portico, over which, but detached and a little to the left-hand, there is a high octagonal column, with three lions sculptured on the top, seated back to back. A colossal statue of Buddha, with his hands raised in supplication, is on the east side of the portico. A number of male and female figures, which seem to represent dancers, nearly naked, but not indecent, are carved above the screen which separates the vestibule from the temple. The temple is entered by a large door, above which are three windows contained in a semicircular arch. A colonnade of octagonal pillars surrounds the temple on every side except the entrance. The ceiling of the cave is a semicircular arch, curiously ornamented with slender ribs of teak-wood, of the same curve as the ceiling, which they seem to support; this however is not the case.

Salsette is supposed to contain about 50,000 inhabitants, who are chiefly occupied in fishing, of whom about 10,000 are of Portuguese origin. The Portuguese obtained possession of the island in the 16th century; but it was taken from them by the Mahrattas in 1750, and conquered from the Mahrattas by the British in 1774.

SA'LSOLA, a genus of plants of the natural family of *Chenopodiaceæ*. The species are chiefly found on the sea-shore in temperate parts of the world, and also in hot parts of the world where the soil is saline or there is salt water in the vicinity. *S. kali*, so named from yielding Barilla, or Kali, that is, alkali, is found on the coasts of Europe, and of many parts of the world, and is one of the species which is burnt for the purpose of yielding kelp and barilla. *S. sativa* is a species found on the southern coast of Spain, where some pains are taken to extend it by cultivation, for the purpose of yielding barilla when burnt. *S. soda* is found on the southern coast of Europe, and in the north of Africa.

SALT. [SODIUM.]

SALT TRADE. The principal part of the salt of England is made in the valley of the Weaver in Cheshire. When the salt duty was repealed in 1824, there were 75 works where salt was raised in a fossil state: 34 were at Northwich, 26 at Winsford, 3 at Middlewich, and 2 at Nantwich, all in Cheshire; 2 were at Shirley Wich in Staffordshire; 6 at Droitwich in Gloucestershire; and 2 in Durham. There were at the same time 35 works at which salt was made by evaporation from sea-water, 29 of which were in Hampshire and the Isle of Wight. In Scotland, at the same time, there were 15 salt-works, and in all of them salt was made from sea-water. The rock-salt is used to strengthen the brine from salt-springs, from which the salt used for domestic purposes in England, and also a large portion of what is exported, is produced by evaporation. The Cheshire brine-springs are from 20 to 40 yards in depth, and are very productive. The process of solar evaporation is now entirely disused. Nearly the whole of the salt exported is made in Cheshire, and is sent down the river Weaver, which communicates with the Mersey, to Liverpool. The Staffordshire rock-salt is chiefly exported from Hull, and that of Gloucestershire from the port of Gloucester.

A duty of 10*s.* per bushel was laid on salt in 1798, which in 1805 was increased to 15*s.* In 1823 this duty was reduced to 2*s.*; and in 1825 was wholly repealed. Salt used in the fisheries, in bleaching, or in agriculture, was nearly duty-free. The salt exported in 1847 amounted to 16,271,927 bushels.

The British government in India monopolises both the manufacture and sale of salt. In the ten years 1836-45, the net receipts from this monopoly of home-salt, and duty on imported salt, varied from 989,389*l.* to 1,707,287*l.* annually. It is believed that a moderate duty on British salt would yield as large a revenue in the course of a few years, if the monopoly were abolished, while commerce would be benefited by the interchange of East India sugar and other native commodities for British salt; smuggling in salt, which is extensively carried on, would cease; and in place of arbitrary and harsh restrictions, the consumer would obtain a better article at a cheaper rate. (*Report from Select Committee of the Commons on Salt, British India*, 1836.)

SALTA. [PLATA, LA.]

SALTASH. [CORNWALL.]

SALTCOATS. [AYRSHIRE.]

SALTPETRE. [POTASSIUM.]

SALTS. The term Salt, originally restricted in its application to common salt, which it still means when used merely by itself, is now applied to a vast number of substances which have in many cases few properties in common.

Common salt is the principal of a class composed of a metal and such bodies as chlorine, iodine, bromine, and fluorine, and the radicals of the hydracids. It was formerly believed that common salt was a compound of muriatic acid and of soda; and hence it was very commonly called muriate of soda. But it has been shown by

Davy that the acid and alkali during their action on each other suffer mutual decomposition; and that while water is formed by the union of the hydrogen of the acid with the oxygen of the alkali, the chlorine of the muriatic acid and the sodium of the soda unite to form chloride of sodium. It has since been proved that this occurs with all that are called *hydracids*, when they act upon metallic oxides.

The *Oxy-Salts* form another numerous and important class of compounds; these are formed when an oxacid is made to combine with an oxidised base; as, for example, when sulphuric acid unites with soda, the result being sulphate of soda. The sulphates of potash, lime, magnesia, &c., are similarly constituted.

Another class of bodies has been described by Berzelius as coming within the description of salts, namely the *Sulphur-Salts*. In this country however they generally are classed together as double sulphurets: thus, according to Berzelius, the well-known copper pyrites, or double sulphuret of iron and copper, is a sulphur-salt.

In general properties the various classes of salts, and indeed the individuals of the same class, differ as widely as possible; some are crystallisable, others uncrystallisable; they are colourless, and of various colours; sapid and insipid; soluble and insoluble in water, alcohol, and other menstrua; volatile and fixed in the fire; decomposeable or undecomposeable by the same re-agent.

Salts have been conveniently, though not quite correctly, divided into alkaline, earthy, and metallic salts; for strictly speaking most of the alkaline and earthy are metallic; and to these classes must be added the ammoniacal salts and the salts of the vegetable alkalis. Again, salts constituted of the same elements may contain one or other in excess; thus soda and various other bases combine with three different portions of carbonic acid. Super-Salts are such as contain an excess of chlorine or of acids, and Sub-Salts such as contain excess of base. Dr. Thomson has proposed, and it is very conveniently adopted in practice, to describe the degree of excess of acid in the super-salt by Latin terms, and that of the excess of base by Greek: thus while a compound of two equivalents of chlorine and one of a base, or of an acid and base, is called a *bi*-chloride or *bi*-sulphate, as the case may be, a compound containing one equivalent of chlorine or acid to two of base, is termed a *di*-chloride, &c.

SALVEN, River. [Birma.]

SALUZZO. [Coni.]

SALVADOR, SAN. [Bahamas.]

SALVADOR, SAN. [Central America.] This state has lately (1850) entered into a federal union with Nicaragua and Honduras. The central seat of the federal government, which consists of two members from each state, is in the city of Chinandega.

SALVADO'R, SAN, the capital of the state of San Salvador, and the seat of the former federal government of Central America, is situated in 13° 45′ N. lat., 88° 50′ W. long., and has about 39,000 inhabitants. The town is built on undulating ground, at a height of more than 2000 feet above the sea, in a kind of valley, surrounded by high hills covered with wood, among which, in a north-eastern direction, and at a distance of about 10 miles, is the volcano of San Salvador. It enjoys a very temperate climate, warm enough however for the cultivation of sugar, plantations of which alternate in the vicinity of the town with extensive orchards. The town is laid out with considerable regularity, the streets crossing each other at right angles. The pavement is very bad. The houses are low, consisting mostly of a ground-floor. In the centre of the city is a square, three sides of which are lined with shops, with porticos before them, supported by a colonnade; on the fourth side is the cathedral. There are manufactures of iron-ware and cutlery, which are highly prized all over Central America. Coarse cotton-stuffs are also made here. The number of white families is not great, and the mestizoes, or ladinoes, as they are called here, constitute the bulk of the population. Sugar and indigo are sent to Acajutla and to Libertad, ports on the Pacific, which are respectively 50 and 30 miles distant from the town.

SALVADOR, SAN, Province. [Bahia.]

SALVADOR, SAN, or BAHIA, a large seaport town, formerly the capital of Brazil, is built on the eastern shore of the strait leading from the Atlantic to the fine harbour of Todos os Santos, or All Saints' Bay, and a little north of the lighthouse on Cape San-Antonio, which stands in 13° 0′ 30″ S. lat., 38° 30′ W. long. Of the two entrances to the bay formed by the island of Taporica, the western, called Barra Falsa, is narrow, intricate, and at its mouth has not more than 6 feet water. The largest vessels can pass through the eastern entrance between the island and Cape San-Antonio. The bay within presents a capacious basin with several islands and harbours, a depth of water varying from 8 to 40 fathoms, and ample room and shelter for all the fleets in the world. Several rivers run into the bay, a circumstance which accounts for the current that generally flows from the north end of the island of Taporica past Cape San-Antonio: this current when the rivers are flooded is sometimes very strong. The usual place of anchorage is opposite the city to the north and south of the Fort do Mar, which is built on a small rocky islet. This fort and another, called San-Filipe, built on the promontory of Monserrate, protect the anchorage. North of the Punta de Monserrate the land retires and forms a small bay called Tagagipe, which serves as a dock-yard.

Opposite the anchorage lies the city, which consists of two towns, the Citade Baixa, or Praya, and the Citade Alta. The Praya (beach) is a strip of low land, so narrow as to admit only of a single street, except in the middle, where five short streets branch off eastward. It is the seat of commercial activity, where the large warehouses are situated. Here also are the numerous workshops of the jewellers, who work in gold and silver, and set the precious stones that are brought from the Minas Novas. The town is meanly built, ill-paved, and dirty. Among the buildings the Exchange and the church of Nossa-Senhora are distinguished by their architecture. The church

is a fine edifice, with a front of European stone, and is richly decorated within. At the southern extremity of the Praya is the royal dock-yard and the arsenal. At the back of the Praya rises a hill with a steep ascent. Some parts of the declivity are covered with buildings, but the steeper parts are planted with bananas and orange-trees. The streets leading to the Citade Alta are almost impassable for carriages.

On the top of the hill stands the Citade Alta, on an undulating surface, from 100 to 300 feet above the sea-level. Most of the streets are wide and straight; the houses are built of stone, and from two to five stories high. The centre of the town lies in a depression, and contains the best streets, and several squares, among which is Praça da Parada, where the palace of the governor, the town-hall, the mint, and the court-house are situated. The most remarkable building in this part of Bahia, and indeed in all Brazil, is the College of the Jesuits, with the contiguous church, which is magnificently decorated and is used as a cathedral. The college contains a public library of 12,000 volumes. The greater part of the building is however appropriated to a military hospital. Of the other churches, more than thirty in number, that of the Italian Capuzins is the most remarkable. Other remarkable public buildings are the city hospital, the school of surgery, the house for white orphans, and the palace of the archbishop. Within the circuit of the town there is a considerable number of gardens and orchards. At the south-eastern extremity of the Citade Alta is the *Passeio Publico*, or public walk, on one of the most elevated eminences of the town, from the pavilion of which the whole bay, with its green islands, and the Atlantic Ocean, can be seen. The city is defended on the land side by several forts of no great strength.

The population of Bahia is stated to be about 160,000, the majority of whom are negroes. Three roads lead from Bahia to the interior of Brazil, by which the foreign goods reach the places of consumption, and the produce of the country is brought to market. The exports consist of sugar, cotton, coffee, tobacco, cigars, rice, rum, molasses, tallow, hides, horns, cocoa-nuts, fancy woods, bullion, &c. In 1817 Bahia exported 27,300 cases, of 13 cwt. each, of sugar. In 1842, the chief exports were 52,000 cases of sugar; 16,000 bags of cotton, 170 lbs. in each; and 12,500 bags of coffee, 160 lbs. in each. For the year ending Sept. 30, 1849, it exported 62,000 cases, and 9925 bags of sugar; 19,500 bales of cotton; 20,238 bags of coffee; 82,866 hides; 9554 pipes of rum; and 10,901 bales of tobacco. The imports consist of different kinds of cotton fabrics, woollen stuffs and cloth, linen, iron and tinware, provisions, flour, salt, fish, soap, wines, codfish, leather, furniture, &c.

SALVADO'RA, a genus of plants which has been placed in different families, but usually in *Chenopodiaceæ*. Endlicher attaches it to *Plumbaginaceæ*, but under the name of *Salvadoraceæ*. The species are few in number, and found only in warm and dry parts of the world, as in India, Persia, Arabia, and on the coasts of the Mediterranean, whence they extend along the north of Africa, from the Nile to Senegambia.

SALVADORA'CEÆ, a natural order of Monopetalous Exogens, comprising only one genus, *Salvadora*.

SALVAGE. [Ships.]

SALVATOR ROSA. [Rosa, Salvator.]

SALVETAT, LA. [He'rault.]

SA'LVIA, a genus of plants belonging to the natural order *Lamiaceæ* or *Labiata*. The species of this genus are well known both as ornamental shrubs and on account of their uses in domestic economy. The best known and that which is used most frequently in this country is the *Salvia officinalis*, the garden Sage. It is a native of various parts of the south of Europe. This plant is much used in cookery, and is supposed to assist the stomach in digesting fat and luscious kinds of food. Sage-Tea is also commended as a stomachic and slight stimulant. *Salvia pomifera*, Apple-bearing Sage, is a native of the rough open hills in Crete and various parts of the Levant. It is remarkable for being liable to the attacks of an insect of the *Cynips* genus, which produces upon their branches little protuberances similar to galls upon the oak, but much larger. These morbid growths contain an acid aromatic juice, and on this account are valued by the inhabitants of Crete as an article of diet. *Salvia sclarea*, common Clary, is a native of Italy, Syria, and Bithynia, and is one of the longest known of the exotic herbs found in British gardens. It is sometimes used for making wine, which has a taste resembling that of Frontignac, and is remarkable for its narcotic qualities. *S. splendens*, *Indica*, *formosa*, and *fulgens* are all handsome ornamental flowers, and as such are much cultivated.

SALVIA'TI, IL, FRANCESCO ROSSI, so called from having been patronised by the Cardinal Salviati, was the son of Michel Angiolo Rossi, and was born at Florence in 1510. He studied painting first under Andrea del Sarto, and Baccio Bandinelli, and was the fellow-student and friend of Giorgio Vasari. At Rome, amongst other works, Salviati painted the Annunciation and Christ appearing to St. Peter in the Church of La Pace, and, in conjunction with Vasari, ornamented the Cancellaria with several frescoes.

From Rome he went to Venice, and thence to Mantua and Florence. In Florence he was employed by the grand-duke to decorate one of the saloons of the Palazzo Vecchio, where he painted the Victory and Triumph of Furius Camillus. Upon the invitation of the Cardinal de Lorraine, he visited France, where he painted for Francis I. some part of the château of Fontainebleau. In Paris he executed a fine work for the church of the Celestines, representing the Taking down from the Cross. He afterwards returned to Rome, where he died in 1563.

SALVINIA'CEÆ, a small natural order of Acrogenous or Flowerless Plants, comprising only two genera, *Salvinia* and *Azolla*.

SALZBURG, formerly a duchy, lately a circle of Upper Austria, and now a Crownland or distinct province of the Austrian Empire, lies between

Bavaria, the Tyrol, Illyria, Styria, and Upper Austria, comprising the high mountainous region which incloses the numerous valleys that open into the lovely basins of the Salzach and the Upper Saale. The area is 2754 square miles, and the population is 145,564. It is covered by the Noric Alps, which on its southern frontier branch out from the Rhætian Alps. The mountains on the eastern frontier form an almost uninterrupted chain of glaciers, here called Kees, and present all the varieties of Swiss scenery, defiles, avalanches, cascades, lakes, &c. Some of them are covered with perpetual snow. The country is open to the north only, wnere the Salza issues from the mountains and forms a fruitful plain, which however is marshy in some parts. The principal rivers are the Salza or Salzach, the Saale, the Ens, and the Mur. The lakes are numerous; that called the Zellersee is ten miles long and two broad. Of the many mineral waters, the hot springs of Gastein are the most celebrated. The cascade of the Krimonler Ache, near Gastein, is the most striking in Austria; the torrent falls in five breaks from the height of above 2000 feet, forming at last a magnificent arch. The climate is severe. The winter lasts from November till April. The heat in summer is very great in the valleys, and vegetation rapid. Most of the valleys are very fruitful, and produce corn, flax, and fruit. The middle mountain-region is covered with forests, and the upper with Alpine pastures, which afford subsistence to numerous herds of cattle in summer. Wild animals have become scarce, but there are still chamois goats, marmots, bustards, and heath-cocks. The corn produced is not sufficient for the consumption. The products of the mineral kingdom are gold, silver, copper, iron, lead, cobalt, arsenic, rock-crystal, marble, saltpetre, salt, sulphur, and asbestos; turpentine is also obtained. The mines of copper, iron, lead, and arsenic are very productive, and the salt-works of *Hallein*, an old town of 5000 inhabitants, at the foot of the Durrenberg, famous for its salt-mines, are very important. There are, properly speaking, no manufactures; the country people make their own clothing. The inhabitants are a robust race, mostly of Celtic origin, descended from the Roman Taurisci. In some parts of the valley of the Salza, goître is common.

Under the new constitution of the Austrian Empire, the Crownland of Salzburg has a diet consisting of 21 deputies, elected for 4 years—7 from the highest taxed; 8 from the towns; and 6 from the country parishes.

Salzburg, the capital of the province, is situated in the most beautiful spot in Germany, in 47° 48′ N. lat., 13° 2′ E. long., on the Salza, over which there is a bridge 370 feet long, and 40 wide. The city is surrounded with an amphitheatre of lofty Alps. The river runs between two isolated mountains, the Mönchsberg on the left, and the Capucinerberg on the right, leaving in many places only a narrow space, on which the city is built. The streets are narrow and crooked, and the squares small, but regular. The houses are flat-roofed, and built of red marble. The city is surrounded with walls and bastions, and has 8 gates, one of which is a passage cut through the Mönchsberg, 300 feet long, 30 feet high, and 24 broad. Salzburg gives title to an archbishop. The university, founded in 1620, was abolished in 1800, and a lyceum or academy established in its stead, which has a library of 30,000 volumes, a botanical garden, and a geological museum. The monastery of St.-Peter has a library of 40,000 volumes. The city has a theatre, 4 hospitals, a lunatic asylum, and other public institutions. The cathedral, built in the 17th century, in the Roman style, with a façade of white marble, is adorned with paintings and statues of white marble. St.-Peter's Church contains the tomb of St. Rupert, who was buried here in 623. There are in all 26 churches. The archbishop's old palace, called die Residenz, is a very extensive building ornamented with columns; it is now used for public offices. The square in front of it is adorned with the finest fountain in Germany, 45 feet high, made entirely of white marble. On the opposite side of the square is a magnificent palace called the Neubau. The stables for 130 horses are accounted the handsomest in Europe; near is a riding school, with three galleries for spectators, hewn out of the solid rock. The palace of Mirabell, in which the present king of Greece was born, and the church of St.-Sebastian, have been rebuilt since the great fire of 1818. Salzburg is rich in Roman antiquities. A bronze statue of Mozart, who was born here in 1756, has been set up in the Michaelsplatz. The fortress of Hohensalza, commanding the town, is now used as a prison and barrack. There are in the town one military and three civil hospitals, an hospital for incurable patients, several schools, and many other useful and charitable institutions. The inhabitants, 13,500 in number, manufacture calicos, leather, and hardware, and carry on an important transit trade. Salzburg is said to occupy the site of the Roman Juvavia, destroyed by Attila in 448. The town and territory have belonged to Austria since 1814; they previously belonged to Bavaria.

SALZWEDEL. [MAGDEBURG.]

SAMADE'RA, a genus of plants of the natural family of *Simarubaceæ*. The genus contains but few species, which are natives of India and the Indian islands.

SAMANIANS, a Persian dynasty under the khalifs, of which the founder, Ismael, was the first who had the title of Padishah (king). He conquered Amru Laith, the governor of Khorasan, Fars, and Irak. He was recognised as king by the khalif Montadhedh in 287 of the Hejira (A.D. 900), and reigned seven years. His descendants who held this kingdom from father to son, except in the last two instances, in which it passed from one brother to another, were Ahmed, Nasser, Noah, Abdalmelek, Mansor I., Noah II., Mansor II., and Abdalmelek II. The dynasty was superseded by Mahmoud of Ghizni, who incorporated their dominions with his own empire, after a duration of more than 100 years.

SAMAR. [PHILIPPINES.]

SAMARANG. [JAVA.]

SAMARCAND, a town in Asia, in the khanat of Bokhara, is situated near 40° N. lat. and 66° 40′ E. long. It is built not far from the banks of the river Zerafshan, nearly in the centre of a fertile valley which extends on both sides of the river. The country about the town is traversed by a great number of canals which are used for irrigation. It is mentioned in the History of Alexander the Great, under the name of Maracanda, as the capital of the Persian province of Margiana, and seems to have been a flourishing town. (Arrian, 'Anab.,' iv. 3.) In the times of the caliphs it acquired some fame as a seat of learning, but it attained its greatest glory in the 14th century, as the usual residence of the conqueror Timur. Ulugh-Begh, the successor of Timur, being of a different disposition, raised the fame of the town (in the 15th century) as a seat of learning and science, especially of astronomy. At that period it was a large and splendid town. But the family of Timur was driven from the throne and country by an irruption of the Uzbeks towards the end of the 15th century, and as their chief removed the royal residence to the town of Bokhara, Samarcand began to decline. Burnes ('Travels into Bokhara') says that the population is not more than 8000 or 10,000, and that gardens and fields occupy the sites where mosques and streets formerly stood. Yet there are still some buildings which attest its former splendour. Three of the colleges are perfect, and one of these, which formed the observatory of Ulugh-Begh, is very handsome. The tomb of Timur remains, and is under a lofty dome, the walls of which are beautifully ornamented with agate.

SAMARIA. [PALESTINE.]

SAMARITANS. After Shalmanezer, king of Assyria, had taken Samaria and carried the ten tribes of Israel into captivity (721 B.C.), he repeopled the city of Samaria and the surrounding district, which formed the central part of Palestine [PALESTINE], from Babylon, Cuth, Ava, Hamath, and Sepharvaim; and these people, joined with the remnant of the Israelites, were from this period called Samaritans, and sometimes Cuthites. They are frequently mentioned in the Scriptures. Samaritans are still found in their old country, especially at Nablous, near Sichem, and also in Egypt; and they have at various times corresponded with learned Europeans.

The religion of the Samaritans, at least after the building of the temple on Gerizim, differed but little from that of the Jews. They received however no part of the Hebrew Scriptures except the Pentateuch [PENTATEUCH], but they expected a Messiah, and it is remarkable that their notions of his office were more correct than those of the Jews. (John, iv.; Horsley's 'Sermons,' 24-26.) They have been accused by Christian writers of Sadducean tenets.

SAMBOR. [GALIZIA.]

SAMBRE. [AISNE; MEUSE.]

SAMBU'CUS, the name of a genus of plants belonging to the natural order *Caprifoliaceæ*. The species are low deciduous trees inhabiting Europe and North America. The best known of the species is the common or Black Elder, *Sambucus nigra*. This plant is a native of Europe, the north of Africa, and the colder parts of Asia. It is very common in most parts of Great Britain, and is generally found near human habitations. The berries, flowers, and leaves, have been all used in medicine, and expectorant and diaphoretic properties have been attributed to them. In the rural districts of England a wine is made from the berries, which is in great repute, and, when drunk hot, is an agreeable stimulant. The flowers are employed for making a distilled water, which is frequently used as a refrigerant. *S. ebulus*, Dwarf Elder or Danewort, is not an uncommon plant in England and Scotland in way-sides and waste places. It has a very fetid smell, and the roots are violently purgative. *S. Canadensis*, Canadian Elder, is a native of North America and extends from Canada to the Carolinas. *S. racemosa*, Red-Berried Elder, is a native of the south of Europe and Siberia. It is a showy plant, and has a splendid appearance when covered with its fine large scarlet fruit. Many other species of this genus are worth cultivation on account of their flowers, fruit, and foliage.

SAMENESS or IDENTITY. This term is generally applied to what is called personal identity, or the sameness of a living and intellectual being, as man. There are some remarks on this subject by Bishop Butler in his 'Dissertation of Personal Identity.'

The sameness of objects which are external to a man consists in the perception of a variety of circumstances as to these external objects and at different times, from which arises an opinion of sameness in a certain sense. A man sees a tree growing in a certain place, and he may have remembered it for many years. But in the meantime the tree may have increased a hundred-fold in bulk, and its substance is not the same as that of the tree which he first saw there; there may not be even a single particle of matter the same in the tree at two remote times of his observation. The tree then is by the supposition not the same in a strict sense; but for all practical purpose it is called and is the same. A man can no more believe that all the change that the tree has undergone belongs to some other tree than he can believe that the growth of his own body belongs to another being than himself.

When sameness is applied to a living and intellectual being, it includes both the matter of the body and something else. A man can have no doubt that his body is not entirely the same in youth, in middle age, and in old age. He can view his body as he does anything external, and he has a belief that it undergoes changes, and is therefore not the same in the strict sense. But yet he considers himself the same person—person here including something besides the body, whether that something be a property of an organised body or something else. 'The ground of the doubt,' says Locke, as quoted by Butler, 'whether the same person be the same substance, is said to be this—that the consciousness of our own existence, in youth and in old age, or in any two successive moments, is not the same individual action, *i. e.* not the same consciousness, but different successive consciousnesses.' Butler's an-

swer to this vague talk is sufficient. But more may be said. How is consciousness of our personal identity, or, if this form of words be objected to as a way of begging the question, how is the thing called 'consciousness of our existence' at any two successive moments shown to be 'not the same consciousness, but different successive consciousnesses?' What are successive moments in a man's consciousness of his own existence? It is more consistent with that consciousness which we have, to say that the consciousness of our personal identity is one and the same always; and if it is allowed that there is in man a belief that he is at different times the same being, in some sense which he cannot otherwise explain than that he feels that he is, it follows that this consciousness of personal identity is one indivisible thing, that it is as continuous as the personal identity itself which it presupposes. Nor is it any objection that a man's faculties may be temporarily impaired by illness, and he may lose the exercise of his reason and recover it; or an accident may befall him, which for a time renders his bodily and mental powers inactive, though he may finally recover both. On his recovery he does not doubt that he is the same person that he was before his illness or accident, and therefore his consciousness is one. The division of consciousness by successive times, corresponding to certain external signs, and the making that supposed succession a ground of objection to personal identity, is to confound things that are unlike, and to apply a measure to both that does not fit one of the things.

'Every person,' says Butler, 'is conscious that he is now the same person or self he was as far back as his remembrance reaches.' This cannot be disputed. It is a bare fact that this consciousness does exist in us. We have not this consciousness from the very time of our birth up to manhood and old age: it does not go further back in its particular manifestations than our remembrance does; yet we doubt not that we, the man, were once that particular child of our parents rather than any other child of these parents or of any other parents. But this belief is derived from evidence: our consciousness in its particular manifestations does not extend farther back than our remembrance. Yet remembrance does not make personal identity, as Butler remarks: 'Consciousness of personal identity presupposes, and therefore cannot constitute personal identity, any more than knowledge, in any other case, can constitute truth, which it presupposes.'

The remembrance of particular things is a very different thing from the consciousness of personal identity. When this consciousness begins, when it ends, how its activity is suspended, we know not; but we know that it is a law of our nature that, in the ordinary state of a man's bodily and intellectual faculties, he has a perception, whatever it may be and however it may arise, whenever he reviews certain acts of his own or events in his life, that he the perceiver, and no other person, is the agent or is the person affected by these events. The remembrance then merely makes the consciousness of personal identity active; and this consciousness of personal identity is not constituted of the remembrance of different acts or events, but is as permanent and uninterrupted as the animal life itself, which nobody supposes to consist of successive lives, but to be one life. And it should be observed that the question of personal identity only arises upon the suggestion of the memory. Every man all through his life feels that he exists in some sense or in some way, which he expresses by that term 'is.' And he is never without this present consciousness of existence. There is therefore an uninterrupted consciousness, which, as already observed, is one, and not divisible by a measure of time. The remembrance of any particular act of a man's own or of any event in his own life, is a present act, and the consciousness of such present act of memory accompanies the act of memory as it does any other present act; and as the act of memory is retrospective, so is the consciousness of that act of memory retrospective, but only incidentally, according to the nature of the act. The memory merely directs the conscious agent to an act of the kind called passed, and to a passed act of such a kind that the consciousness of sameness in the agent is inseparable from the notion of the act that is remembered.

SAMIELI is the Turkish name of a wind which the Arabs call *Samoom* or *Simoom*, which in Egypt is called *Khamsin*, and in Senegambia and Guinea *Harmattan*. It occurs in most countries which are situated at no great distance from sandy deserts, and it blows always from that quarter in which the desert is situated. These winds are extremely hot, and a considerable quantity of fine sand is generally suspended in the air, which has been collected by the winds in rushing over the desert. They affect the human body very powerfully, producing great feebleness, and sometimes even death. [ARABIA; DESERTS.]

SAMNITES, an ancient nation, or confederacy of nations, in Central Italy, who made a brave struggle against Rome. The Samnites occupied an extensive tract of country on both sides of the central ridge of the Apennines, including the valleys of the Vulturnus, Tamarus, and Calor, towards the Tyrrhenian Sea, and those of the Sarus, Tifernus, Trinius, and Frento, towards the Adriatic, and corresponding to the present provinces of Sannio and Principato Ultra, and parts of Terra di Lavoro, and of Abruzzo Citra, in the kingdom of Naples. The territory of the Samnites was bounded on the N. by the Peligni and Marrucini, and by the Adriatic, for the Frentani, who extended along the coast of that sea, formed part of the Samnite confederation, and were also of Sabine origin. On the E. the Samnites were bounded by Apulia and Lucania; on the S. by the Campanians, being divided from the latter by the ridges of Tifata and Taburnus; and on the W. by Latium Novum and the country of the Marsi. The Samnites were originally a colony of the Sabini, which migrated to the banks of the Vulturnus and the Tamarus, and thence spread on one side as far as the plains of Apulia, and on the other to those of Campania. They were an agricultural and pastoral people, and as their

numbers increased beyond the means of subsistence, they followed the custom of their Sabine ancestors, and sent forth colonies, which were the origin of the Lucanians, who gradually extended as far as the southern extremity of the peninsula. The Samnites were divided into several nations or tribes, known by the names of Pentri, Caudini, Caraceni, Hirpini, and Frentani. Among the principal towns were: Bovianum, now Boiano, near the sources of the Tifernus; Aesernia, now Isernia; Allifae, now Alifi; Maluentum, afterwards called Beneventum. [BENEVENTO.]

About B.C. 340 the first war began between the Romans and the Samnites. The history of the long struggle, which then commenced, is an important part of the history of the Roman subjugation of Italy. It was not until B.C. 290, after half a century of almost uninterrupted war, that the Samnites, worn out by their repeated defeats, sued for peace, which the Romans, likewise exhausted by their dearly-bought victories, felt disposed to grant. The consul M. Curius Dentatus, being charged with the negotiation, concluded a peace, the conditions of which are not known. 'Thus,' says Eutropius (ii. 9), 'ended the Samnite war, which had lasted forty-nine years, against the most persevering enemy that the Romans had to encounter within the boundaries of Italy.' The result of this war, or succession of wars, was that the Romans extended their power over South Italy, Campania, and Apulia, and thus became neighbours, and soon after enemies, of the Tarentines. The Tarentine war brought on the expedition of Pyrrhus into Italy, and the first war of the Romans with an enemy from beyond the limits of Italy. In the war of Pyrrhus, the Samnites joined that prince, after whose second retreat from Italy and subsequent death they found themselves attacked by two Roman armies, under their old antagonists, L. Papirius Cursor the younger and Sp. Carvilius, who utterly defeated them (272 B.C.). It was then that Samnium became a conquered country, and the Romans sent colonies to Maluentum and other places. Florus says that Samnium ceased to exist, meaning as an independent state; and those who reckon this as the end of the Samnite war, give it a duration of seventy years, in which however there were considerable interruptions.

SA'MOLUS, a genus of plants belonging to the natural order *Primulaceæ*. *S. valerandi*, Brook-Weed, is found in damp and watery places in Great Britain.

SAMOS, an island in the Grecian Archipelago, called by the Turks *Susam Adasi*, lying between 37° 35′ and 37° 48′ N. lat., and extending from 26° 36′ to 27° 8′ E. long., situated on the coast of Asia Minor, at the distance of about a mile from the promontory of Trogilium, or Cape Santa Maria, which lies between the gulf of Scala Nova and that of Balat.

In the time of Cyrus, the first king of Persia, Polýcrates was the tyrant, as the Greeks called him, or ruler of Samos. This enterprising man appears to have entertained the design of making Samos a powerful state, for which its position offered great advantages. But he was treacherously put to death in the reign of King Darius I. by a Persian satrap; and the Persians took possession of Samos. The island recovered its independence after the defeat of the Persians at Mýcale, B.C. 479. The history of Samos from this time belongs to the general history of the Greek states of Western Asia. It finally became subject to Rome, B.C. 84.

The inhabitants of this island were distinguished for their commercial activity, and their love of the arts. Sculptors existed in Samos at a very early time, and were flourishing in the time of Polýcrates. Rhœcus, a Samian, built the Heraeum, or temple of Juno, at Samos, the largest which Herodotus had seen (iii. 60). The coins of Samos are numerous. The earliest have the head of a lion or of a bull; a winged wild boar or a prow of a ship are common reverses. Samos at present is under the dominion of the Turks.

The form of the island of Samos is irregular; the greatest length is from west to east, and the circumference is about eighty miles. It is separated from the continent of Asia by a narrow strait about six miles in length, and nowhere more than three in breadth, full of small islands. A high mountain range runs through the island in a direction from east to west.

Immediately opposite to Cape Santa Maria, between the rivers Metelenous and Imbrasius, is the port of Tigani, the ancient harbour of the city of Samos, which has an artificial mole built across it from north to south. Herodotus speaks of an immense mole in this harbour. A little inland is the site of the ancient town of Samos. The walls, of which there are still remains, are cased with white marble, and have square towers. To the west of the city, towards the Imbrasius, are the remains of an aqueduct, which does not seem to be the one mentioned by Herodotus (iii. 60), which was carried through a mountain. Of the great temple of Juno hardly anything remains. Its dimensions were in length 346 feet; breadth 189. It was a dipteral decastyle; had ten columns in front, twenty-one on the sides, a triple row in the pronaos, and a double row of four columns between the antæ at the entrance of the cella in front. The columns were about 7 feet in diameter at the bottom of the shaft, and about 60 feet high. The material was the white and bluish-gray marble of the island. (Leake's 'Asia Minor,' 348.) Opposite to the old city, about a mile to the west of it, is the modern town of Cora, the largest in the island. The summit of Mount Kerkis is said to be covered with snow all the year round; but such a statement requires very particular proof. One of the best harbours in Samos is Vathi, which is capable of holding a large fleet. The soil of Samos is fertile, and produces very good wine. The muscat grape is much cultivated. There is good timber on the hills, which have quarries of white marble in abundance. Samos was formerly celebrated for its pottery, which was made from a particular kind of clay found in the island.

The inhabitants, about 15,000 in number, living in eighteen villages, are nearly all Greeks; they are described by Michaud and Poujoulat ('Correspondence d'Orient,' 1833) as being wretched in

their condition and habits, and of a savage appearance. They are governed by a waiwode and cadi; the former has the care of the revenue, and the latter administers justice. There is also a Christian governor, called an aga, chosen by the people.

SAMOTHRA'CE, a small island opposite the mouth of the Hebrus in Thrace. It was chiefly celebrated for the worship of the Cabíri. According to Herodotus (ii. 51), Samothrace was originally inhabited by the Pelasgians, from whom the inhabitants learnt the religious mysteries which they solemnised. In Homer the island is usually called Samos ('Il.,' xxiv. 78, 753), or the Thracian Samos ('Il.,' xiii. 12).

SAMOYEDES, one of the most widely-spread nomadic nations of Northern Asia. They inhabit two large tracts, one of which extends along the shores of the Polar Sea, and the other on both sides of the Altai Mountains.

The Northern Samoyedes wander about in the country which occupies the western portion of the coast of Siberia, between 45° and 100° E. long., and 70° and 80° N. lat. They are of short stature, seldom attaining five feet. They have round, broad, and flat faces, thick lips, a broad and open nose, very little beard, and very coarse black hair. They are stout, and have muscular limbs. They have herds of rein-deer, but they use this animal only for drawing their sledges. They live chiefly by hunting and fishing. They are heathens. It is stated that the numerous tribes which belong to the Northern Samoyedes amount to 70,000.

The Northern Samoyedes are divided from the Southern Samoyedes by an immense tract of country occupied by the Ostiaks and several tribes of Tungooses.

The Southern Samoyedes inhabit that part of the Altai Mountains which lies between 88° and 105° E. long., and 50° N. lat. Some of this Samoyede country is included within the territories of the Chinese Empire; and these Samoyedes, called Soyotes, are tributary to the Emperor of China, and obliged to do military service along the frontier. The rest of the Samoyedes are in the Siberian territory. Some of the tribes live wholly by the chase; while others have herds of rein-deer, their country being the most southern region in which that animal is met with in Asia. A few have adopted agriculture, but they eat also the roots and stems of some wild-growing plants. The Soyotes, or Chinese Samoyedes, however inhabit a rich pasture country, and live on the produce of their herds, consisting of horses, black cattle, and camels. These Southern Samoyedes exactly resemble their northern kinsmen in the formation of their bodies, except that they have a tolerably thick beard. The different tribes of the Samoyedes speak different dialects of one language, which varies greatly from the languages of all the neighbouring nations, though it contains a considerable number of roots which occur in the languages of some nations of Central Asia.

SAMPHIRE, an herb in much request in some parts of the country as a salad and pickle. The true Samphire is the *Crithmum maritimum*, a plant belonging to the natural order *Umbelliferæ*. It grows on rocks by the sea-side. The species of *Salicornia* are often called Samphire, and are used in the same manner, but they are very much inferior to the *Crithmum* as an article of diet.

SAMUEL, BOOKS OF, two canonical books of the Old Testament, the first of which contains the history of Israel from the birth of the Prophet Samuel to the death of Saul (B.C. 1171–1055); and the second the history of David's reign for about forty years (B.C. 1055–1017). The first twenty-four chapters of the first book of Samuel are ascribed to Samuel himself. As to the remainder, it cannot be exactly determined what part was written by Gad, and what part by Nathan.

In the Septuagint these books are called the First and Second Books of Kings or of the Kingdoms. [KINGS; CHRONICLES.]

SAMY'DA, a genus of plants of the natural family of *Samydeæ*. The species consist of small trees or shrubs, found in the hot parts of America, such as the West Indies, Mexico, and Brazil, with a few doubtful species in the East Indies.

SAMYDA'CEÆ, a natural order of apetalous plants, of uncertain station, and placed by De Candolle amongst Polypetalous Exogens. It is entirely a tropical order, composed of small trees or shrubs. The bark and leaves are slightly astringent. One of the species, *Casearia ulmifolia*, is used in Brazil as a remedy against the bite of snakes, for which purpose the leaves are applied to the wound, and an infusion of them is taken internally.

SAN-FRANCISCO, a sea-port town in Upper California, is situated on the south shore of San-Francisco Bay, an inlet from the Pacific, on the west coast of North America. The Spaniards during the latter half of the 18th century, erected a Presidio or fort, not far from the site of the town, in 37° 48′ N. lat., 122° 26′ W. long. The fort consisted of a square inclosure 300 yards each way, surrounded by a mud wall 15 feet high, and pierced for musquetry. Along these walls on the inner side were the dwellings of the settlers, the space in the centre being left clear for exercise. The walls of the fort are now in ruins. Under the protection of the Presidio, and about 3 miles S.E. from it, the settlement of San-Francisco was founded in 1776, consisting of a few Jesuit fathers, soldiers, and attendants, who erected a church, and around it dwellings for themselves, while the huts of the Indians, whose conversion to Christianity was the original motive for the settlement, were erected in squares at a little distance. By means of this and other similar missions, the Indians became partially civilised, tillers of the ground, and feeders of sheep and cattle, which formed the chief wealth of the community. Matters continued in this state till 1836, when, upon the outbreak of the Mexican revolution, the Jesuit fathers were expelled and the settlements fell into the greatest disorder. In 1847 the province of Nueva California was overrun by a small American force, and by the treaty of Feb. 2, 1848, was ceded by Mexico to the United States. Soon after the Americans seized the country, gold was found on the Sacramento (a river which empties itself into San-

Francisco Bay), and in such quantities as to attract emigrants not only from the adjacent states, but from all parts of Europe, and even from China, Australia, and New Zealand. The population of the province in 1846 was only 15,000; at the beginning of 1850 it was above 100,000, exclusive of Indians. A constitution was drawn up by the American portion of the settlers, Nov. 10, 1849, preparatory to claiming admission for California as a member of the United States of North America.

Since the discovery of the gold, which has been found not only on the Sacramento and its feeders, but among the mountains that inclose its basin and over a large tract of country, the settlement of San-Francisco has grown into an important sea-port and a large town of above 10,000 inhabitants; its harbour is filled with ships from all parts of the world, freighted with various cargoes or conveying emigrants to dig for gold; steamers ply regularly to Panamá in connection with Atlantic steamers at Chagres. On the 1st of January, 1850, 250 ships were lying in the bay deserted by their crews, who had all gone in quest of gold. The accounts received from San-Francisco lead us to believe that the present town consists of houses and stores erected in a hurry, of slight materials, without any regular plan; some few of the structures are of iron, but the great majority are of timber or mud. A large portion of it was burnt down on Christmas-Eve of 1849, and was said to be restored in three weeks. Pavements there are none, and in rainy weather the passages called streets are rivers of mud. But these matters will soon improve. Meanwhile the town, which is the residence of the military governor of California, and the seat of the supreme court for the district of San-Francisco, has a considerable import trade, consisting chiefly of provisions and articles of clothing for the miners, and materials for construction; or, to speak more specifically, of ale, flour, wine, preserved meats, vegetables, drugs, merino drawers, pea-jackets and coats, woollen hose, coloured cotton shirts, red and blue flannel shirts, silks, printed cottons, long and heavy boots, blankets, carpeting and drugget, matting, strong furniture, lumber, tin plates, iron and zinc plates for building materials, bricks, coals, &c. The only export at present is gold, of which there was coined in the United States during 1849, to the value of 1,275,000*l.* pounds sterling; large quantities were also exported to Europe, chiefly to England; and much passed into private hands; so that it is impossible to state the exact amount exported. The revenue laws of the United States were extended to California in 1849, and the accounts of the custom house of San-Francisco will henceforth afford interesting statistics on the subject of the gold exports.

SAN JUAN. [PLATA, LA.]

SAN LUIS. [PLATA, LA.]

SAN MARINO, REPUBLIC OF, is a small territory, consisting chiefly of a steep mountain with its offsets and valleys, covering an area of about 27 square miles. It is situated within the papal province of Urbino, and about 10 miles from the coast of the Adriatic. The whole population amounts to about 7000. The town of San Marino stands on the upper part of the mountain, the summit of which is crowned by an old castle with three towers, on which the standard of the republic waves. The town is ill-built and ill-paved; the streets are steep, and only practicable for mules and donkeys. The square before the town-house is large, and commands a fine view of the neighbouring Apennines. The church of the Capuchins contains a fine painting representing the Descent from the Cross. Outside of the town is Il Borgo, or the suburb; and at the foot of the mountain are three or four villages, Serravalle, Acquariva, Feglio, &c. The inhabitants have cultivated every slip of ground that can be made productive; they make very good wine and oil, and rear silk-worms, the produce of which constitutes an article of trade. They have also some good cattle. They import corn from the neighbouring Papal State.

The origin of the republic of San Marino is lost in the obscurity of the dark ages. Marinus, a holy hermit from Dalmatia, is said to have retired to this mountain in the fourth century A.D., and after his death a church was raised to his memory, and a village grew up round the spot. In the 10th century it became a walled town by the name of 'Plebs Santi Marini cum Castello.' It seems to have governed itself as an independent municipality; and we find in the 12th century that the commune of San Marino purchased some lands from the neighbouring counts of Montefeltro, lords of Urbino. During the wars of the Guelphs and Ghibelines, the people of San Marino took the part of the latter, and were excommunicated by Innocent IV. The commune of San Marino being summoned, towards the end of the 14th century, to pay certain dues and fees to the papal government, refused; and the matter being referred to a learned judge of Rimini, called Palamede, he decided that the community and men of San Marino were exempt from payment, having been of old independent of all foreign dominion, a decision which was confirmed by the vicar Theodoric. From that time San Marino has been acknowledged as an independent state by the popes, although some popes, or rather their legates in the Romagna, have attempted at times to enforce their authority over that little state, but the attempt has not been persevered in.

When Bonaparte overthrew the papal government, he respected the independence of San Marino; and in 1814, when the pope was reinstated in his dominions, the freedom of the republic was confirmed. The legislative power is in the hands of a council of 300 anziani, or elders, and the executive consists of a senate of twelve, with a gonfaloniere, who is changed every three months.

SAN PELLIGRINO. [BERGAMA.]

SAN REMO. [NICE.]

SAN SEVERO. [CAPITANATA.]

SANADON, NOEL-ETIENNE, was born at Rouen, February 16, 1676. Having entered early into the order of Jesuits, he became professor of rhetoric first at Caen, and afterwards at Paris. He died October 22, 1733.

The Père Sanadon possessed considerable learn-

ing. He is the author of a prose translation of Horace, Paris and Amsterdam, 1728, 2 vols. 4to. There is a subsequent edition in 8 vols. 12mo., 1759. Sanadon is the author of a Latin heroic poem, 'Nicanor Moriens,' which contains some pleasing imitations of Theocritus, Anacreon, and other Greek poets. He wrote also some Latin lyric poems, 'Carminum Libri Quatuor,' Paris, 1715, 12mo., and translated the 'Pervigilium Veneris,' Paris, 1728, 12mo.

SANCERRE. [CHER.]

SANCHEZ DE ARE'VALO, RODRI'GO, generally known as Rodericus Sanctius, was born at Santa Maria de Nieva, in the diocese of Segovia, in 1404. After receiving his classical education at the university of Salamanca, he entered the church, and was made successively archdeacon of Treviño in the diocese of Burgos, dean of Leon, and dean of Seville. Sanchez was employed on several missions by John II. and Henry IV. of Castile. On the accession of Paul II., Sanchez, who had been prevailed upon by his predecessor to settle at Rome, was promoted to the bishoprics of Zamora, Calahorra, and Palencia, which he however governed without quitting Rome. He died at Rome, October 4, 1470. Among his published works is the 'Speculum Vitæ Humanæ,' &c., Rome, 1468, folio, a treatise on morals, divided into two books, in which very heavy censure is passed on the clergy; and 'Liber de Origine ac Differentia Principatus,' wherein he attempts to prove the supremacy of the pope over all princes, Rome, 1521.

SANCHEZ, FRANCISCO, was born at Las Broças, in the province of Estremadura in Spain, in 1523. He commenced his studies at the university of Valladolid, where he took his degree of bachelor of arts in 1551. From thence he went to Salamanca, where he obtained, in 1554, the chair of rhetoric, and also taught Greek and Latin. Justus Lipsius, Scioppius, and other scholars of his time, speak of him in the highest terms. In 1574 Sanchez had already edited Persius, Pomponius Mela, the 'Ibis' of Ovid, the 'Bucolics' of Virgil, and Horace's 'Art of Poetry.' He now devoted his time to the work which gained him most reputation, his 'Minerva; seu de Causis Linguæ Latinæ Commentarius,' which appeared for the first time at Salamanca in 1587, 8vo., and was often reprinted during the 16th century, and also since. Sanchez died on the 17th January, 1601, at the age of 77. Sanchez was the author of a Latin Grammar, a Greek Grammar, and various other works. His minor works, with the exception of the 'Minerva,' were published at Geneva, in 1766, 4 vols. 8vo.

SANCHEZ, THOME, was born at Cordova, in 1550. At the age of sixteen he entered the society of the Jesuits, and in course of time became director of the noviciate at Granada. His great work is his 'Disputationes de Sancto Matrimonii Sacramento,' which he intended as a sort of manual for confessors. This work, in which the author displayed great learning, has been the subject of much animadversion (Bayle's 'Dict.,' vol. ix., p. 45), owing to the free manner in which the subject is treated. It was first printed at Geneva, 1602, folio, and has subsequently gone through fifteen different editions. Sanchez died 19th May, 1610, at Granada, where he was interred with great pomp.

SANCHU'NIATHON, a Phœnician writer, whose period is unknown. Some make him a contemporary of Queen Semiramis. His birthplace, according to the general opinion, was Bérytus; but nothing is known about him.

The original works of Sanchuniathon, which were written in the Phœnician language, are lost. A Greek translation was made by Philo of Byblus, a grammarian who lived during the latter half of the first century of our æra. The original work of Sanchuniathon is said to have consisted of eight books (Porphyr., 'De Abstinent.,' ii., p. 94), but the translation of Philo was divided into nine books. (Euseb., 'Præp. Evang.,' i., p. 31.) The work of Eusebius just referred to contains a considerable fragment of the history of Sanchuniathon, which gives an account of the gods of the Phœnicians and Egyptians. A useful edition of these fragments was published at Leipzig, in 1826, by J. C. Orelli. In 1835 a MS. containing the whole of the nine books of Philo's translation of Sanchuniathon was discovered in the convent of Santa Maria de Merinhao, in the province of Entre Douro e Minho in Portugal. This discovery created a great sensation throughout Europe, but the opinions of scholars were divided; some declared the work to be a forgery of Philo, while others, and especially Grotefend, contended that the work was the real translation of Sanchuniathon made by Philo. At last almost all scholars agreed that the work is spurious. In 1836 Wagenfeld published a German translation of it, with an introductory discourse by Grotefend.

SANCROFT, WILLIAM, was born at Fresingfield in Suffolk, in 1616, and was early destined for the church. He studied in Emmanuel College, Cambridge. He was living in the University in 1642, but soon after lost his fellowship at Emmanuel in consequence of his refusal to take the Solemn League and Covenant. It was between this period and the restoration of Charles II., that he produced his work entitled 'Modern Policies and Practices.' Some part of this time was spent abroad. A little before the king's return, he was in England, and was chosen one of the University preachers. In 1660 he was collated to the rectory of Houghton-le-Spring, and made a prebendary of Durham. In 1662 he was made Master of Emmanuel College; in 1663, dean of York; in 1664, dean of St. Paul's; in 1668, archdeacon of Canterbury; and in 1678, archbishop of Canterbury.

When James II., intending to introduce popery, issued his declaration for liberty of conscience, Sancroft refused to publish it in the churches as directed, and, accompanied by six other bishops, presented a petition to the king against the declaration; he was committed to the Tower with the other prelates, but they were all acquitted on their trial. He concurred in the declaration for a free parliament when King James had withdrawn himself, but when the Prince and Princess of Orange were declared king and queen, he refused to acknowledge them as such, and was in conse-

quence deprived of his dignity. Retiring to Fresingfield, the place of his birth, he lived in a state of great seclusion till his death, Nov. 24, 1693.

SANCTO'RIUS, the Latinized form of the name of an eminent Italian physician, who was called in his own language Santorio. He was born in 1561, at Capo d'Istria, studied medicine and took his degree at Padua, and then settled at Venice as a practitioner, where he had considerable success. In 1611 he was recalled to Padua, and appointed professor of the theory of medicine in that university. He there commenced a series of observations on insensible perspiration, which have made his name known throughout Europe, even among those who do not belong to the medical profession. 'For the better carrying on these experiments,' says Addison, in the 'Spectator,' No. 25, 'he contrived a certain mathematical chair, which was so artificially hung upon springs that it would weigh anything as well as a pair of scales. By this means he discovered how many ounces of his food passed by perspiration, what quantity of it was turned into nourishment, and how much went away by the other channels and distributions of nature.' He continued to lecture at Padua to numerous audiences for thirteen years, until his reputation occasioning his being frequently sent for to Venice by the people of distinction in that city, he resigned his chair, in order to dedicate all his time to medical practice. His resignation was accepted, but the salary continued; and with this testimony of the public esteem he removed and settled finally at Venice, where he died in 1636, aged seventy-five. A marble statue was erected to his honour in the cloister of the Servites, where he was interred; and the College of Physicians at Venice, in return for a legacy which he bequeathed them, annually commemorate him in a laudatory harangue. He wrote several works in Latin on medical subjects.

SANCTUARY, a consecrated place which gave protection to a criminal taking refuge there. The word also signified the privilege of sanctuary, which was granted by the king for the protection of the life of an offender. Under the dominion of the Normans there appear early to have existed two kinds of sanctuary; one general, which belonged to every church, and another peculiar, which originated in a grant by charter from the king. The general sanctuary afforded a refuge to those only who had been guilty of capital felonies. On reaching it, the felon was bound to declare that he had committed felony, and came to save his life. A peculiar sanctuary might, if such privilege was granted by the charter, afford a place of refuge even for those who had committed high or petty treason; and a party escaping thither might, if he chose, remain undisturbed for life. He still however had the option to take the oath of abjuration and quit the realm. During the latter part of the reign of Henry VIII., at the time when the religious houses were dissolved, several statutes were passed (26 Hen. VIII. c. 13; 27 Hen. VIII. c. 19; 32 Hen. VIII. c. 12), which regulated, limited, and partially abolished the privilege of sanctuary, both as regarded the number and classes of criminals entitled to it, and also the places possessing the privilege. Finally, by 21 James I. c. 28, s. 7, it was enacted that no sanctuary or privilege of sanctuary should be admitted or allowed in any case. [Asylum.]

SAND. A mass of any comminuted minerals is in popular language called sand; but the most abundant ingredient in the extensive sands of the deserts, sea-shores, river-banks, and soil, is granular quartz or flint.

Little attention has been paid by geologists to this abundant covering of the earth's surface. Most of the sands which we observe are the ruins of disintegrated rocks; red, white, gray, black, according to the rocks from which they were derived. On examining these rocks themselves, we find them composed of grains of such sand, not crystallized grains, but worn and rounded on their surfaces like small pebbles. The parts of these solid rocks then have once existed as mere loose sand, and we seem to return in a circle to the point of departure.

Soil often contains sand, though the subjacent strata be wholly calcareous or finely argillaceous. This fact proves that the surface has been traversed by currents of water, which have mixed materials of different qualities, and have thus in many cases increased the fertility of soils. Sands blackened by oxide of iron, and others nearly white, are very sterile. Sands of a brownish or reddish colour are often fertile.

SAND-EEL. [Ammodytes.]

SANDAL-WOOD. [Santalum.]

SANDARAC. [Thuja.]

SANDBACH. [Cheshire.]

SANDBY, PAUL, R.A., was born at Nottingham in 1732. He came to London in 1746, and studied at the drawing school at the Tower. In 1746 William, duke of Cumberland, appointed him draughtsman to the survey of the Highlands; and while in Scotland he took a number of views from which he made several small etchings, which were published in folio on his return to London. In 1752 he went to Windsor, and took no less than seventy views in that neighbourhood and at Eton. These were purchased by Sir Joseph Banks, who invited him to accompany him on a tour in Wales. He shortly afterwards published a series of views in Wales, engraved in aquatinta (a style of engraving which he carried to great perfection) from his own drawings.

As one of the directors of the chartered Society of Artists in 1753, he was foremost in proposing an enlargement of their plans and labours, in opposition to Hogarth and others. The dispute ended in the secession of the principal members of the society (among whom was Paul Sandby), and the formation by them in 1768 of the Royal Academy, of which he was chosen one of the first members.

In 1768 he was also appointed Professor of Drawing to the Royal Military Academy at Woolwich, an office which he held till his death, in November 1809, when the Marquis Cornwallis conferred it upon his son. As a landscape painter he was eminent in his profession; and he made great improvements in water-colour painting. He also painted in oil and in body colour. His etchings and engravings are very numerous.

SANDBY, THOMAS, R.A., the brother of the preceding artist, was professor of architecture at the Royal Academy, from its institution in 1768 till his death in 1798. He was born in 1721, and was appointed about the year 1743 private secretary and draughtsman to William, Duke of Cumberland, with whom he travelled on the continent in 1748. In 1746 he was appointed Deputy Ranger of Windsor Great Park, an office which he held for fifty-two years, and as architect to the Woods and Forests, planned the works undertaken by his Royal Highness at Windsor, known as the Virginia Water, &c.

SANDEC. [GALIZIA.]

SANDEMANIANS, a small religious sect, consisting of persons who profess to be followers of Robert Sandeman, a native of Perth, born in 1713. They are however really an offset from the Glasites of Scotland, followers of Mr. John Glas, a minister in the Presbyterian church, who was removed from his office, on account of certain peculiarities of religious opinion, in 1728. Mr. Sandeman married Catherine Glas, daughter, we believe, to John Glas, and entered into all his peculiarities. In 1757 he commenced publishing his system. In 1760 he removed to London, where he preached in various places, and attracted much notice, and in 1764 he removed to the American Colonies, where he continued till his death.

The leading doctrine of the sect is thus expressed in the epitaph on Mr. Sandeman's tomb at Danbury in New England:—'Here lies, until the resurrection, the body of Robert Sandeman, who, in the face of continual opposition from all sorts of men, long and boldly contended for the ancient faith, that the bare death of Jesus Christ, without a deed or thought on the part of man, is sufficient to present the chief of sinners spotless before God.'

The best account which has been given of this sect is to be found in 'The History and Antiquities of the Dissenting Churches in London,' by Walter Wilson, in four volumes 8vo. (vol. iii., p. 261–276.) The sect is said to be more numerous in America than in England.

SANDOMIR. [POLAND.]

SANDO'RICUM, a genus of plants of the natural family of *Meliaceæ*. The genus contains only a single species, found in the hot parts of Asia, *S. Indicum*. The fruit is acid, and sufficiently agreeable to be mixed with syrups to make cooling drinks: its root is bitter, and used as medicine in bowel complaints.

SANDOVA'L, FRAY PRUDENCIO DE, a Spanish historian, was born at Valladolid, others say at Monterey in the province of Galicia, about 1560. He took monastic orders at the Benedictine convent of Santa Maria la Real de Naxera, where he passed several years, devoting all his attention to the study of the civil and ecclesiastical antiquities of Spain. Having gained some reputation by his writings, he was made abbot of San Isidro de Guengua at Valladolid, and was soon after appointed historiographer to Philip III. This monarch charged him with the continuation of the 'Cronica General' of Ambrosio de Morales [MORALES], which Sandoval published under the title of 'Historia de los Reyes de Castilla y de Leon.' Sandoval afterwards held the bishopric of Tuy in Galicia, whence he was translated to that of Pamplona in 1612. He died at Pamplona, March 17, 1621. Among his numerous works are the following:—'Cronica del Inclyto Emperador de España Don Alonso VII.,' Madrid, 1600, fol. 'Historia de la Vida y Hechos del Emperador Carlos V.,' in two parts, Valladolid, 1604, fol. There are two old English translations, or rather abridgments, of this work. Sandoval is justly considered by Spaniards one of their best historians.

SANDOWAY. [ARACAN.]

SANDPIPER. [SCOLOPACIDÆ.]

SANDSTONE. The aggregation of sands into stone takes place by the entire confluence of the grains (through a sort of semifusion), as in quartz rock, and in common gritstones which adjoin trap-dykes or great faults; by mere coherence of grains, as in many white sandstones; by interposition of finer particles of carbonate of lime, clay, oxide of iron, &c., as in the sandstones of coal tracts; or by a complete infiltration of subcrystallized carbonate of lime, as in some of the Hastings sandstones. In regard to structure, we have laminar sandstones, the laminæ plane, waved, or even slightly concentric; and freestones, in which, without any real lamination, the grains are arranged unsymmetrically and indiscriminately, so as to present in the mass equal resistances in every direction. The laminar sandstones can be split; the freestones may be worked with ease in any direction. Sandstones, in popular language, occupy a station intermediate between sand and gritstone; but there is little consistency in the geological application of the term.

SANDRART, JOACHIM VON, was born at Frankfort on the Main, in 1606. Having received a good general education, he devoted himself to the study of the arts, and was first instructed in engraving by Theodore de Bry and Matthew Merian. He afterwards studied painting at Utrecht under Gerhard Honthorst. He is said to have accompanied Honthorst to England, and to have executed several works in this country; but this is very doubtful. It is certain that he spent several years in Italy. At Venice he copied the finest pictures of Titian and Paul Veronese, and at Rome was much employed by Cardinal Barberini and Prince Giustiniani. After a long residence in Italy he returned to Frankfort, and executed many considerable works for the Emperor Ferdinand, and for Maximilian, duke of Bavaria. He passed the latter years of his life at Nürnberg, where he died in 1683. At Nürnberg he published several works, particularly his Lives of the Painters, under the title of 'Academia Artis Pictoriæ.'

SANDWICH. [KENT.]

SANDWICH ISLANDS are a group of islands situated in the Pacific, between 18° 55′ and 22° 20 N. lat., and between 154° 50′ and 160° 40′ W. long. They extend within these limits in a slightly-curved line from south-east to north-west. The islands are thirteen in number; eight of them are of moderate size, and the other five small. The larger islands are Hawaii, Mauï, Tahaurawe,

Ranaï, Morokoï, Oahu, Tauaï, and Nihau. The area of the whole group is about 6000 square miles.

Hawaii, formerly called *Owhyhee*, the most south-eastern island, is the largest of the whole group, and indeed twice as large as all the rest together. In form it approaches to a triangle, and is nearly 100 miles long from south to north, and nearly 80 miles wide in the broadest part. The interior is occupied by a table-land 8000 feet above the sea-level, chiefly covered with lava and ashes, but in some places overgrown with wanti-trees, or paper-mulberry trees. The edges of this table-land are distant 20 to 25 miles from the sea. On the table-land are many lofty mountains, some of which have an elevation of more than 13,000 feet; they are all volcanic. A volcano on this table-land is very remarkable. This volcano is not, like other volcanoes, a conical mountain, but a depression below the general surface of the slope, of somewhat irregular shape, with almost perpendicular sides. The elevation of the slope where this vast pit occurs, is 3873 feet above the sea-level. The steep descent to the crater is interrupted by two narrow plains or ledges, the first of which is 715 feet below the upper surface, and the next about 100 feet. The crater contains two lakes, the surfaces of which are 43 feet below the last-mentioned ledge. The smaller lake is nearly of a circular form, and 319 yards across; the larger is 1190 yards long, and in one part about 700 yards wide. These lakes are vast cauldrons of lava in a state of furious ebullition, sometimes spouting up to the height of 70 feet. The fiery waves run with a steady current at the rate of nearly three miles and a quarter per hour southward, enter a wide abyss, and fall into the sea in 19° 12′ N. lat. All the country round this volcano is covered with lava. To the east of this volcano, and at the distance of 370 yards, is a perfectly circular volcano of much smaller dimensions. On the neck which separates these two volcanoes the ground opened in 1832, and discharged liquid lava for three days into both craters, a large part of which was thus filled up.

From the edges of the table-land the country has a gradual slope to the sea. The higher part of this slope is covered with dense forests, consisting chiefly of several species of acacia, which attain a great size, and of which the canoes of the natives are made. The lower part of the slope, and the strip of land thence to the sea, have a fertile soil and a great variety of productions. The N.E. coast is mostly bold and steep, the other coasts are inclined.

Byron Bay, on the Eastern shore, is a spacious harbour which lies S. and N.; it is protected from the north-east wind by a coral reef. It is the best harbour on the island; there are two others, Towaihae and Karakakoa.

Mauï, or *Mowee*, is situated N.W. of Hawaii, and is separated from it by a strait 24 miles wide. It is about 48 miles long, by 29 broad. It is composed of two masses of rock, surrounded by a narrow tract of low land, and united by a low and sandy isthmus which is nine miles in width. The larger mountain mass, which occupies the eastern portion of the island, is supposed to rise nearly 10,000 feet above the sea, but it contains only a small portion of low and cultivable land. The smaller mountain-mass has a fine tract of level land along the south-western coast. It extends three miles along the beach, and runs three-quarters of a mile inland. The harbour of Laheina, nearly in the centre of the plain, is formed by two low projecting rocks, two miles distant from each other.

Tahaurawe lies S.W. of the larger peninsula of Mauï. It is about 11 miles long from E. to W., and 8 miles wide in the broadest part. It is composed of lava, which however rises only to a moderate elevation. The soil is thin, and covered with a species of coarse grass. Between this island and Mauï is that of Morokini, which is a small and barren rock of some elevation; it is only occasionally visited by fishermen.

Ranaï, which lies W. of the smaller peninsula of Mauï, is separated from that island by a strait nine or ten miles wide. It is 17 miles long, and about 9 miles wide. A great part of it is barren, and the remainder is only of moderate fertility.

Morokaï, or *Morotoi*, lies N.W. of Mauï and N. of Ranaï; it extends 40 miles from E. to W., and 7 from S. to N. It consists of one mass of rocks, the most elevated portion of which rises about 5000 feet above the sea, and the sides are furrowed by deep ravines full of trees.

Oahu, or *Woahoo*, lies N.W. from Morokaï, and is about 46 miles long by 23 broad. It contains a larger proportion of cultivated land than the other islands. A mountain-range traverses the island; and another mountain-mass occupies the north-western part. The island exhibits great varieties of level and of fertility. Honolulu, the capital of the Sandwich Islands, and the residence of the king, is in this island. The harbour is not more than half a mile long and a quarter broad; but it is tolerably deep and perfectly safe. It is formed by a coral reef, which extends along the shores at the distance of some hundred yards.

Tauaï, or *Atooi*, W.N.W. of Oahu, is about 40 miles long by 24 broad. It is a mountain-mass sloping on all sides towards the sea, where it terminates with a rather high coast. On the southern coast, at Waimeá, there is a roadstead, but there is no other anchorage round the island.

Nihau, or *Oneehow*, the most western of these islands, is about 20 miles long by 7 broad. The most southern point rises abruptly to a considerable height; but about five miles north, the rocky mass sinks down to a moderate elevation, and afterwards rises again, but not so high as before. On the western side of the island there is a very good harbour.

Climate and Productions.—The climate is principally regulated by the trade-winds. The rainy season occurs in winter. In summer the atmosphere is usually clear and bright, and, in that season, at many places on the western side of the islands not a drop of rain falls. The heat all the year round is considerable in the lower tracts, but moderate considering the latitude. The elevated table-land in the interior of Hawaii is of course much colder, and snow frequently falls there. In the lower districts on the western side of the islands the sea and land breezes are generally regular, especially during the summer.

The quadrupeds found on these islands at the time of their discovery were the hog, dog, and rat, to which have been added the cow, horse, sheep, goat, and mouse, all of which thrive very well except the sheep. Fowls were found at the discovery; but turkeys, geese, ducks, and pigeons, were introduced afterwards. Fish abound; and many families live on the produce of the fishery. Pearls are found in Pearl River; they are small, but fine.

Various kinds of tropical plants were cultivated before the arrival of Europeans; and many sorts of fruit have been since introduced from Europe. European grains, with the exception of maize, are not cultivated to any great extent. The forests do not contain many trees fit for ship-building. In several parts the mountains were formerly covered with sandal-wood. The forests contain several plants, the roots or fruits of which are used as food by the natives.

Salt is the only mineral which is obtained in abundance. A large quantity is got from a salt-lake in the island of Oahu, west of Honolulu, which is between two and three miles in circumference, but has only a few feet of water in the deepest parts. The bottom and shores are incrusted with salt, the water being strongly impregnated, and the crystallization very rapid. This salt is exported to Kamtchatka. Large quantities of salt are also obtained from sea-water by evaporation, for which purpose there is along the shore a succession of artificial reservoirs of clay, into which the salt water is let at high tide.

Inhabitants.—The population consists of natives, with the exception of a small number of whites, Englishmen and Americans, who have settled among them as merchants or as missionaries. The natives, who call themselves Kanaka, belong to the family of Malay nations. Their colour is a kind of olive; they are of middle stature, and well formed, with muscular limbs, and open countenances. The roots of their language have a great affinity to those of the other Malay nations who inhabit the islands of the Pacific. When these islands were discovered by Cook, it was observed that the natives of this group had made further progress in civilization than those of the other islands of the Pacific. At that time they wore only a wrapper about their loins, but many of them now dress in the European fashion.

A considerable change is taking place among the inhabitants of these islands. While on the one hand the establishment of commercial firms is giving a European aspect to Honolulu, the emigration of the natives to California and other places, the practice of infanticide, and other causes, are gradually reducing the native population. At a census taken in 1832, the population of the islands was 130,000; in 1836 it was 109,000; and by 1840 it had decreased to 88,000. When Sir George Simpson visited Honolulu in 1842, he found in that town about 8000 natives and 1000 Europeans and half breeds. He states that the native women usually dress in plain and modest attire, introduced by the missionaries, except on Sundays, when they appear adorned with silks, chintzes, ribbons, and parasols. 'It is no uncommon thing on Sundays to see a finely-dressed female walking arm in arm with a husband unencumbered in his person by any more of this world's possessions than a sort of apron of twelve inches by three, while at the same time others of the natives may be seen in the same town dressed in military surtouts, with frogs, &c., all complete, in white trousers, fashionable boots, round hats, kid gloves of some gay or delicate colour, with their snowy wristbands turned back over their cuffs, the whole dandy being finished off with cane and eye-glass.'

Commerce.—The inhabitants employ themselves much in ship-building and navigation. Vessels built at Honolulu, and manned by natives, traverse the Pacific to Canton. By selling their produce to the vessels which visit the islands, the natives procure all the foreign articles which they are in want of. Many of these vessels are whalers, and others go to several parts of the western coast of North America to get furs for the Chinese market. Several of them are bound to China and the East Indies, and pass round Cape Horn or through the Strait of Magalhaens. There are consuls at Honolulu from several of the European nations; and an agent of the Hudson's Bay Company. The Sandwich Islands are becoming more and more an object of commercial interest, from their advantageous position in respect to Pacific navigation. The discovery of the gold deposits at California has drawn away many of the natives from the islands: some to go to the diggings, and others to sell commodities at San Francisco.

History.—These islands were discovered by Captain Cook in 1778, and again visited by him on his return from Behring's Strait, when he was killed by the natives. Within the first twenty years after their discovery they were only visited by Portlock and Dixon, La Perouse, and Vancouver. But towards the end of the last century, whaling-ships from America began to visit these seas, and they were soon followed by fur-traders; all these vessels put into some of the ports for provisions. At that time each island had its sovereign and several other chiefs; but they all came afterwards under the sovereignty of one chief named Kamehameha, who placed his kingdom under the protection of England in 1817. His successor, Rhio-Rhio, came to London, where he died in 1824. He had succeeded in 1819 in abolishing idolatry and in the conversion of the natives to Christianity. Since that time many English and American missionaries have resorted to these islands, and their labours have been attended with considerable success.

In 1843 disputes arose between the King Kamehameha and the British residents. Lord George Paulet, in the Carysfort, made stringent demands for reparation; the King offered to cede the island altogether to the British, but the home government declined the offer. Satisfaction was rendered for the alleged injuries, and the King placed himself in some respects under the control of the British, for his own security. In May, 1845, the King drew up a constitution for the island. The legislature consists of a senate and a house of representatives. The King appointed

his home, foreign, and judicial ministers, and opened his first session with a royal speech. The independence of the government so formed was formally acknowledged by England, France, Belgium, and the United States.

SANDWICH LAND is the name given by Cook to a number of islands in the Southern Atlantic, between 57° 10′ and 59° 40′ S. lat., and between 24° and 27° 42′ W. long. They extend from north to south. The most northern group is called Candlemas Islands, and the most southern is named the Southern Thule. They are all of volcanic origin, and several burning volcanoes have been seen on them. Some of them are very high, and covered with perpetual snow. Others are bare rocky masses, slightly elevated above the sea-level, and all of them are without any trace of vegetation.

SANDYS, GEORGE, was born in 1577, at the palace of Bishopsthorpe, his father, Dr. Edwin Sandys, being then Archbishop of York. In 1589 he was sent to Oxford, and became a member, first of St. Mary Hall, and afterwards, as Wood thinks, of Corpus Christi College. ('Athen. Oxon.') In 1610 he commenced his travels in the East, returning, as Wood supposes, in 1612. His account of his travels was published in 1615.

After this Sandys went to America, and appears to have succeeded his brother as treasurer for the English colony of Virginia. During his residence he completed his translation of the 'Metamorphoses' of Ovid. On his return to England he was appointed one of the gentlemen of the privy chamber to the king. In 1636 he published a 'Paraphrase upon the Psalms,' and two years afterwards 'Paraphrases on the Book of Job, Ecclesiastes, the Lamentations of Jeremiah, and Songs selected out of the Old and New Testaments;' in 1639 a translation of 'Christ's Passion,' a tragedy by Grotius. His last work was the poetical version of the 'Song of Solomon,' in 1642. He died at Bexley Abbey, in Kent, March, 1643–4.

Specimens of his compositions, both in poetry and prose, are given in the 'Memoir of his Life,' by the Rev. H. J. Todd, prefixed to 'Selections from Sandys's Metrical Paraphrases,' &c., London, 1839.

SANGALLO, or SAN GALLO, a family of Italian artists and architects, whose original name was Giamberti.

1, *Giuliano Giamberti*, born in 1443, was the son of Francisco Giamberti, who was himself an architect in the service of Cosmo de' Medici. He was employed in the capacity of military engineer by Lorenzo de' Medici; but he determined on pursuing architecture as his profession. He had soon an opportunity of displaying his talent in the fore-court or cloister of the church of Santa Maddalena de' Pazzi at Florence. He was afterwards commissioned by Lorenzo to erect a large convent (destroyed during the siege in 1530) near the gate of San Gallo, whence he obtained the name of *da San Gallo*, afterwards adopted by himself and the rest of the family. Among his numerous other works was a palace erected by him at Savona, for the Cardinal della Rovere (now converted into the convent of Santa Chiara); besides other buildings for the same prelate. He died at Florence, in 1517.

Giuliano had a son named Francesco, who is spoken of by Vasari as a skilful sculptor then living, and who executed the mausoleum erected at Monte Casino by Clement VII. in honour of Piero de' Medici.

2, *Antonio Sangallo*, brother of the preceding, was induced by him to quit the profession of sculpture for that of architecture. He visited Rome, where he ingratiated himself with Alexander VI., to whom he proposed to convert Hadrian's mausoleum into a fortress, and he altered that building into its present form, since which time it has been called the Castle of St. Angelo. The Duke Valentino employed him to erect the fortress of Civita Castellana, and afterwards that of Montefiascone. He likewise erected several churches, among which that of the Madonna at Montepulciano is esteemed his best production of that class. He died in 1534.

3, *Antonio Sangallo*, the most noted of the family, was nephew to the two preceding on the mother's side. His father was a cooper at Mugello, named Bartolomeo Picconi. He was at first put to the business of a common carpenter, but afterwards became the pupil of his uncles in Rome, and he found also an instructor and protector in Bramante. Cardinal Alexander Farnese (afterwards Paul III.) employed him to rebuild his mansion in the Campo de' Fiori, the first beginning of that splendid pile, which would of itself alone have established the reputation of Sangallo. Passing by many other works, we proceed to his project for completing St. Peter's, of which, on the death of Peruzzi, in 1536, Sangallo became the sole architect. His model for the completion of the building is still preserved in one of the rooms of the Vatican. After his death his design was abandoned altogether, not a trace of it being visible in the present structure. An elevation of Sangallo's model is given in the first volume of Wood's 'Letters of an Architect.' It is true the design is broken into a multiplicity of parts, yet they are both agreeably proportioned to each other, and picturesquely combined; and the whole is consistent in character, which is more than can be affirmed of Maderno's façade. The Palazzo Farnese, begun by him for his patron Paul III. when cardinal, and afterwards greatly extended, is the most celebrated of Sangallo's works. He must however share the repute of it with Michael Angelo, who designed the magnificent cornichione. Sangallo begun the Porta San Spirito at Rome, but left it unfinished, in which state it has ever since remained. He died at Terni, in October, 1546, advanced in years, but at what precise age is not known.

SANGUISORBA, the name of a genus of plants, the type of the suborder *Sanguisorbeæ*, in the natural order *Rosaceæ*. Of this genus there are nine known species. Most of them possess astringent properties. The Common Burnet (*S. officinalis*) is a native of Britain. It was formerly cultivated to some extent, but has been superseded by Sainfoin and other artificial grasses.

SANHEDRIM, or SANHEDRIN, the great council of the Jews, which consisted of seventy-one or seventy-two members, and decided both ecclesiastical and civil causes. The name is a corruption by the Talmudists of the Greek *συνέδριον* (*a council*). The Rabbis attempt to find the origin of the Sanhedrim in the seventy elders who were appointed by Moses to assist him in his judicial duties (Numb., xi. 16); but this council was evidently temporary, and we hear nothing of it in the subsequent history of the Jews. (Michaelis 'On the Laws of Moses,' art 50.) There can however be little doubt that the Sanhedrim was an imitation of the seventy elders of Moses. The first mention of the Sanhedrim is in the time of Hyrcanus II., when Herod was tried before it. (Joseph., 'Antiq.,' xiv. 9, s. 3, 4.)

Besides the Sanhedrim at Jerusalem, there were inferior courts in each town of Judæa, consisting of twenty-three members, to which the same name is sometimes applied. From these courts an appeal could be made to the Sanhedrim.

SANMICHE'LI, MICHE'LE, was born in 1484, at Verona, where both his father Giovanni and his uncle Bartolomeo were architects. About 1500 he set out for Rome, and remained in the Papal State till the time of Clement VII. While there, he erected the cathedral of Montefiascone (the cupola of which was destroyed by fire at the beginning of the 17th century), and the church of San Domenico at Orvieto. He was employed by the Republic of Venice in 1525 to construct the fortifications of Verona, when he first introduced the use of triangular and pentangular bastions. His works of that class belong to construction rather than design, though some of them are remarkable even in the latter respect; for instance, the stately rusticated façade of the fortress or Castello di San Andrea on the Lido at Venice, and the three fortified gates at Verona, Porta Nuova, Porta del Palio, and Porta Zenone.

He was next employed by the republic in fortifying many places in Istria and Dalmatia, Cyprus and Candia, some of which works he confided to the execution of his nephew Gian-Girolamo. Among the palaces erected by him are the Palazzo Grimani and the Palazzo Cornaro à San Paolo at Venice, and several at Verona. In Verona he also built the church of the Madonna di Campagna, and the much admired Cappella Pellegrini. He died in 1559.

SANNAZA'RO, JA'COPO, born at Naples, in 1458, studied there, and afterwards left his country and travelled to France, where he began writing his 'Arcadia,' a pastoral fable in Italian. It is a mixed composition of prose and verse, and has been much admired for the elegance of the style and the purity of the language. Sannazaro also wrote a Latin poem, 'De Partu Virginis,' which obtained for the author the favour of two popes, Leo X. and Clement VII. He also wrote Piscatory Eclogues in Latin verse. On his return to Naples he fixed his residence at Mergellina, near the foot of Mount Posilipo, where Frederic, the last king of Naples of the Aragonese dynasty, had given him a country-house. When the Aragonese dynasty was driven away from Naples, Sannazaro accompanied King Frederic in his exile, and remained with him in France till Frederic's death, after which he returned to Naples, where he died in 1530.

SA'NNIO, a province of the kingdom of Naples, now called *Molise*, lies between the ridge of the Apennines and the Adriatic; the district of Isernia however lies on the west slope of the Apennines, and belongs to the basin of the Volturno. The province extends from 41° 10′ to 42° N. lat., and from 14° 3′ to 15° 10′ E. long.; the area is 1777 square miles, and the population in 1845 was 353,083. It is traversed by the river Biferno, the ancient Tifernus, which rises from two sources in the high Apennines near Bojano, and enters the Adriatic near the town of Termoli; and by the Trigno, which flows nearly parallel to, but to the north of, the Biferno. In the lower part of its course the Trigno marks the boundary between Sannio and the province of Abruzzo Citra. South of the Biferno, the Tortore constitutes, during part of its course, the boundary between Sannio and Capitanata. The central ridge of the Apennines, which runs from N.W. to S.E., sends out several offsets, which run towards the Adriatic. Between these offsets there are valleys through which the rivers flow with a rapid course. The two principal valleys are those of the Trigno and the Biferno. The valleys and the lower hills are very fertile, and produce corn, maize, pulse, oil, wine, and fruits. The highlands are chiefly used for summer pasture. The only manufactures of importance are cutlery and fire-arms. The coast fishery affords employment to a good many hands, but only in fine weather, for the province has not a single harbour.

The province is divided into 3 districts:—Campobasso, which embraces the central part; Larino, which comprises the sea-coast; and Isernia. The principal towns are:—*Campobasso*, which is indifferently built, but pleasantly situated on the slope of a hill above the Biferno, and has a royal college, manufactories of cutlery, and 8000 inhabitants: *Trivento*, a bishop's see, in the valley of the Trigno, with 3000 inhabitants: *Sepino*, the ancient Samnite town, Sepinum, which is situated in the Apennines, and has several churches, a classical seminary, a paper-mill, and 4000 inhabitants: *Termoli*, the ancient Interamna, an episcopal town on the coast, which stands between the Trigno and the Biferno, and has a castle on a promontory, and 5000 inhabitants: *Larino*, a small town with 4000 inhabitants, in the valley of the Biferno, not far from the sea: *Agnone*, a thriving modern town, with iron and copper works, and about 7000 inhabitants: *Bojano*, an old decayed town in the Apennines, with a population of 3000, near the sources of the Biferno: and *Isernia*, an episcopal town, which is situated in a valley near the Volturno, and on the high road from Naples to Abruzzo: it contains several remains of antiquity, and has some manufactories of coarse woollen, with about 5000 inhabitants.

SANOK. [GALIZIA.]

SANQUHAR. [DUMFRIESSHIRE.]

SANSANDING, a town in Africa, in the

kingdom of Bambarra, on the north bank of the Niger, near 13° N. lat. and 5° W. long. It is a place of considerable extent, containing a population of between 8,000 and 10,000. It appears to be a town of great commercial importance, perhaps not less so than Timbuctoo, with which it carries on an active trade by means of the river, which is navigable for large river boats all the way between the two towns. All the salt which is consumed in the western countries of Soodan is brought from the Sahara, and passes through this town. It receives also coral and beads from the Mediterranean. These articles are sent to the countries south and west of Sansanding, and exchanged for gold, ivory, slaves, wax, honey, and cloth of Soodan. The trade of this place is in the hands of the Moors.

SANSCRIT LANGUAGE AND LITERATURE. The Sanscrit is a branch of the Indo-Germanic family of languages; and above all others, by the originality, purity, and abundance of its forms, it is calculated to throw light on the laws of the formation of language. It also possesses a rich literature, which has furnished materials for native grammarians to work upon. The introduction of the study of Sanscrit into Europe has given birth to comparative grammar, by which means we have now arrived at the conclusion that the ancient Persian, the Armenian, the Greek, and the Latin, the German, the Lettic, the Slavonian, and even the Celtic, are all branches from one stem.

The Sanscrit was introduced into India when the Brahminical race obtained possession of the country; and having driven out the languages of the aborigines of India, which are now only spoken in the Southern Deccan, as the Telinga, Tamul, and others, it has spread over the extensive tract of country between the Himalayas, the Indus, and the Kistna. It has passed through many changes. It appears in its most ancient form in the Vedas, and in that state is very nearly related to the Zend, the ancient language of Persia, and contains many forms and words which have become obsolete. The classical Sanscrit, on the contrary, having once become fixed, has, for about 3000 years, partly as a living language and partly as a learned one, retained the same structure, with the mere exception of difference in style, and a few archaisms, which only occur in the most ancient works.

Out of the Sanscrit however, even in comparatively early times, dialects arose, which gradually became still farther removed from the original and from each other; and from these dialects the languages now spoken in India are derived. There is a law however which pervades the whole of them; and it is worthy of remark that this law is precisely the same as that according to which the Romance language, the Italian, the Spanish, and the French, have grown out of the Latin. There is the same softening, the same assimilation, and the same exclusion of the harsher sounds, the same weakening of the forms, the same substitution of particles for cases, and the same periphrastic conjugations. The general name given to these languages by the Indian grammarians is *Prâcrita*, that is, derivative languages; while the term *Sanscrita* is applied to that language which is regularly and grammatically constructed.

The oldest of these dialects, and that which deviates least from the Sanscrit, is the *Pali*, which has become the sacred language of the Buddhists. The Buddhists carried it from Northern India to Ceylon, where the Pali has continued to exist, and possesses a copious literature.

The oldest literature of the Sanscrit language is the Vedas. [VEDAS.] The rest of the Sanscrit literature is either poetical or scientific. The subject of the 'Râmâyana,' one of the great epic poems, is the descent of Vishnu, for the purpose of averting the threatened destruction of the whole world by the prince of the dæmons, Ravana. The story is told in the first six books; but there is a seventh book, which is obviously a later addition, and consists of matters which are entirely independent of the former narrative. It is plain that this poem has undergone many alterations. It contains many things which point to very ancient times; but customs introduced at a later period are not alluded to, as for instance the burning of widows, which was practised in the age of Alexander. In other parts circumstances are referred to which bring us as far down as the second century A.D., the names of comparatively recent nations being mentioned, for instance the Huns. The time of the composition of the poem cannot therefore be ascertained with any further degree of accuracy; and all minuter investigations must be deferred until the whole poem is printed. The 'Râmâyana,' since the last re-casting of the poem, has undergone several revisions. The MS. which contains the oldest and the best text is confirmed by commentaries; another, which we have from the later Bengalee critics, may almost be called a paraphrase. Cary and Marshman first commenced an edition (Serampore, 1806–10, 4to. 3 vols.) which contains the first two books, with an English translation. The text is founded on these two revised copies. A. W. von Schlegel undertook a critical edition of the 'Râmâyana,' founded on a comparison of the MSS. existing in Europe, in which the text of the commentators has been restored. One volume of the text has been published, and the first part of the second volume of an extremely elegant Latin translation (Bonn, 1829, 8vo.)

For the second of the two great epic poems, see MAHABHARATA.

To the same period belong the law-books, the *Sastras*, among which that of Manu has obtained the highest reputation. [MANU.] Besides the book of Manu, there were many similar books, which were likewise referred to sacred mythological personages, as Vishnu, Vrikaspati, Nârada, and others. The 'Yâjnavalkya Sâstra' still exists in the commentary (the 'Mitâxara') which was written upon it; and indeed the original work might be tolerably well restored from it. The 'Mitâxara' quotes numerous passages from the 'Gautamasâstra,' another work of the class, which may still probably exist in India in a complete state.

The *Purânas*, if we regard the form, must be classed with the ancient epic. They are voluminous collections of legends and traditions, written to elucidate the origin and history of some particular holy place or a certain sect, and to be read to the people for their instruction at the great festivals. They all begin with a cosmogony, to which they add the genealogy of the gods and the development of the periods of the world, as well as unconnected historical traditions, so as to form a fabulous chronology; and thus they come down to the history of the sacred place to which they are especially dedicated; they then conclude with the miracles, and so forth, which have been performed there. The Purânas have been chiefly made known to us by the analyses of Wilson in the Asiatic Journals of Calcutta and London, by his translations of the 'Vishnupurdna,' London, 1840, 4to, and by Burnouf's edition of the 'Bhâgavata,' vol. i., Paris, 1840.

Sanscrit poetry received a new character in consequence of the revolution which took place in Sanscrit literature about the first century before Christ. Instead of the popular and national character which appears in the two great epic poems, it now assumed an artificial form, and became the poetry of courts and princes. The new poetry is poor in invention, and drew its materials from the former. Its whole merit consists in what may be called style.

The *New Epic Poetry* begins with Câlidâsa, to whom two works of this class have been ascribed, 'Kumârasambhava' and 'Raghuvansa.' [CALIDASA.] The materials of these poems belong to the mythic cycle of the 'Râmâyana.' The disposition to describe rather than to narrate appears as well in single passages as in the whole. Whenever an opportunity occurs, long descriptions are introduced, such as pictures of natural objects, to which the old epic poetry was also inclined, but more sparingly, and only incidentally; here however they encumber the whole progress of the action. This is much more the case in the two following poems, the 'Kirâtârjunîya,' or 'the Battle of the Arjunas with the Kirâtas,' by Bhâravi, and 'Sisupâlabadha,' or 'the Death of Sisupâla,' by Mâgha, both founded on episodes of the 'Mahâbhârata.' They are classical compositions, and elaborated with the utmost nicety; but the art of the poet degenerates into a mere play upon words: there are verses which may be read forwards and backwards, and upwards and downwards; others in which only one and the same consonant is used.

Lyric Poetry, in the proper sense of the term, did not exist among the natives of India at this period, for even here their fondness for description has taken the place of everything else; and instead of lyric poetry, we have the epigrammatic, didactic, and descriptive. Even their amatory poetry appears to be not so much the expression of feeling, as a studied and laboured display of situations. An agreeable work of this description, the 'Amarûsatakam,' consists of 100 single small poems, each of which is nothing more than a stanza which represents an amatory scene. (Published at Calcutta.) To this class belongs also the 'Sringâratilaka,' which has been improperly ascribed to Câlidâsa; and other works of the same kind.

In the opinion of the natives the *Indian Drama* had its origin in very ancient times, as appears from the fact of their attributing the invention of it to the gods. So much is certain, that its development is due to the sacred solemnities, and partly to the dances; and accordingly the technical name for drama, *nâtaka* (dance), still remains, though in the extant dramas there is no dancing; and partly to the puppets, which are still used in Java in the representation of pieces taken from the Indian mythology: a trace of this latter origin is preserved in the name of the stage-director, *sûtradhâra*, or *thread-holder*.

Such performances are still retained in their original form at the festivals of Râma and Krishna. The characters come forward one after another, and sing a song accompanied with gesture. The Indian drama is still in a low condition: the distinction between tragedy and comedy is unknown, and it most nearly resembles the modern opera. The Indian dramatists have not yet arrived at the discrimination of character; all the heroes and heroines resemble one another; and the species rather than the individual is represented. There are also standing characters, such as the *vita*, who is the *gracioso* of the Spanish stage, and the *vidûsthaka*, who is the clown of the old English. This latter personage is always the necessary attendant of the principal hero, whom he parodies, and whose ideal wishes he contrasts with his own practical views, and these contrasts are often very strongly coloured. The dialogue is in prose, but is interspersed with verses in the lyric metres, always of the descriptive character, which sometimes exhibit a feeling or a situation, and sometimes describe something which cannot be actually represented on the stage, as the rapid travelling of a vehicle. The dramatic literature of India is beyond all doubt much richer than we are yet aware of. The names of about 60 pieces are known to us, of which 10 have been edited, and we are indebted to Professor Wilson for longer or shorter notices of 22 others. ('Theatre of the Hindus,' 2nd edit., Lond., 1835.)

The classic age of the Indian drama may be divided into three periods: the first includes the time before Câlidâsa, of which only one piece remains, 'Mrichhakati,' 'The Toy-Cart,' by King Sûdra. It is easy to discover that this piece belongs to the early period of art: the poet has to contend with materials which he does not well know how to handle. The second period begins with Câlidâsa, under whom the Indian drama reached its highest degree of perfection. We have two pieces which are attributed to him, 'Sakuntalâ' and 'Vikramorvasî.' Câlidâsa is indeed the most perfect of the Indian dramatists.

The third period begins with Bhavabhûta, at the commencement of the eighth century, whose æra is established by a passage in the 'Chronicle of Cashmere.' Bhavabhûta constructed his works entirely according to the dramatic theory of previous writers. He has a very high reputation in India, but he has the faults consequent on the

direction thus given to his genius. With all his poetic talent, he is deficient in true dramatic spirit; his results are laboured, and there is always a display of art and a want of nature. Description is with him always in excess, and the diction of single passages is both artificial and pompous, and to Europeans therefore not without difficulty. As specimens of dramas of intrigue in the Indian style, 'Ratnâvali' and 'Mâlavikâgnimitra' are worthy of notice. The first was written in the 12th century by Srîharsha, king of Cashmere, or under his name; the other was probably prior to Bhavabhûta. The plan of these pieces is not unskilful, and the language is easy and graceful.

It was much later before the peculiar species of drama made its appearance which is called *prahasana* (*comedy*, or rather *farce*). The pieces are short, but they are valuable as exhibiting an entirely new kind of literature. They are bitter satires, as unrestrained as those of Aristóphanes, and aimed at the deep state of degradation into which the Indians had sunk, chiefly through the corruption of the Brahmins. The 'Dhûrtasamâgama' ('the assembly of rogues') is a playful wrangle between a Brahmin and his scholars about a courtesan. The piece has the merit of parodying in a happy manner the bombastic style of Bhavabhûta. This little piece belongs to the end of the 15th century. (Published in Lassen's 'Anthologia Sanscritica,' Bonn, 1838.)

The 'Gîtagovinda' of Jayadeva, written in the 12th century, is entirely different from the works already described. It is a poem intended for performance at a festival of Vishnu. It exhibits the separation of Krishna from his wife Râdhâ, his love-adventures with the shepherdesses, and the reconciliation of the husband and wife, in a series of songs, which are connected and introduced by strophes which describe the situations. The strophes were intended for recitation, the songs to be sung. This is the only Sanscrit poetry which we possess that can properly be called lyric. But the songs are entirely written on the model of the Pracrit songs, which alone appear to have been intended for singing, and they have throughout the Pracrit metres. (Printed at Calcutta, 1806; and there is an excellent edition by Lassen, Bonn, 1836, 4to.)

As the old epic poems were especially designed for the warrior caste, so the Vaisyas, the third class, have a literature of their own, the *Narrative*, of which the first which requires notice is *Fable*, which is indigenous to India. In the 'Râmâyana' and in Manu there are allusions to well-known fables, and others are related in the 'Mahâbhârata.' The two chief works of later times, but which are still of some antiquity, are the 'Panchatantra' and 'Hitopadesa.' [Bidpai.] The 'Kathânakâs' are short narratives and tales. They are known to us chiefly through three modern prose works, which contain obvious marks of having been derived from older metrical collections. The whole series has only been printed in translations into the modern languages of India. Lassen has published part of the Sanscrit original in his 'Anthologia.' But there is another still more important work, a great collection of all the existing tales, which was undertaken by Samadeva of Cashmere in the 12th century; it is entitled 'Vrihatkathâ,' 'the great narration,' or 'Kathâsaritsâgara,' 'the ocean of the streams of narrations.' It is written in the epic metre, and in a simple style. (About a fourth part of the work has been published by Brockhaus, Leipzig, 1840.) The works in this collection are peculiarly interesting to us, since even in the middle ages they found their way to Europe under various forms, as 'The Book of the Seven Wise Masters,' &c.; and the knowledge of the original text clears up many difficult questions of literary history. Some of the oldest and best of the 'Tales of the Thousand and One Nights,' have been drawn from this source, and even in the Arabic version they retain many features which belong only to India.

With the exception of a very modern chronicle of Orissa (abridged by Stirling, 'Asiat. Resear.,' xiv.), there is only one *historical work* in existence in the Sanscrit, 'The Chronicle of Cashmere,' properly entitled 'Râjataranginî,' 'the stream of the kings;' it was written in the 12th century by Kalhana, partly from ancient sources, which he mentions. There have been three successive continuations of this Chronicle, which describe the period of the Mohammedan dominion down to Akbar. The work is written in the artificial style, in the epic metre, and has a good deal of the form of a 'Purâna.' It was first made known in Europe by Wilson's Analysis ('Asiat. Resear.,' xv.); afterwards edited at Calcutta, 1835, 4to.; and lastly, the first six books, with a French translation by Troyer, were published at Paris in 1840. The Buddhists, on the other hand, have a history, chronologically worthy of credit, which is continued according to the series of their patriarchs. Hitherto the only publication of the original Indian text has been that of the 'Mahâvansa,' in Pali, by Turnour. (Colombo, 1837, vol. i., 4to.) This deficiency of historical literature is in some degree compensated by numerous inscriptions, which have been found in all parts of India, but of which hitherto very few have been deciphered and published.

The *sciences* to which the natives of India have been original contributors, are philosophy, grammar, astronomy, and algebra.

The contemplative character of the natives early led them to metaphysical speculations, and the collision which must soon have occurred between the results of those speculations and the Vedas, would contribute to stimulate philosophical inquiry. Hence arose many systems; of those which are held to be orthodox we are specially acquainted only with six; but as these six are related to each other by twos, they can only be regarded as three distinct systems.

The *Sânkhya* system however is the most ancient. It is founded on a duality of soul and matter (or nature); the first being the free, pure, uncreated, and uncreating principle; the second, the creating power of nature, blind and purposeless. The one cannot be thought of without the other; they form for themselves the yet unde-

veloped being, and from them proceeds, by a regular gradation, from the spiritual to the intellectual, and then to the most corporeal, the whole visible world. Every human being indeed possesses the spirit, but in union with the senses; and his task is, by the conquest of the senses through the medium of the intellect, to attain to the final deliverance, 'moksha,' or blessedness, which is accomplished in the 'jnâna,' that is, the 'gnosis,' knowledge. This system underwent a reformation in the *Yoga* system of the Pâtanjali. It is here established, that knowledge is the way to attain to the final deliverance, but knowledge itself can only be obtained through 'yoga,' absorption into God and mystical union with him, and a perfect abstraction from everything which can disturb the mind or awake the passions. The system assumes, that the pure spirit is the creator, and thus it connects itself with the notions which belong to religion; it also adopts the metempsychósis, inasmuch as it fixes degrees of the yoga; the spirit comes back to inhabit new bodies till it has attained the highest degree of the yoga. The Vedas are held in esteem as means of knowledge, but they are not valued more highly than other means, since a man is to perform what is said in the Vedas freely, and not merely on account of the written word. Hence has arisen the saying, that the 'yogin' is exalted above the Vedas.

The doctrines of the Buddhists are founded on the Sânkhya system. [BUDDHA.]

The second system is the *Nyâya*, of which Gotoma is the author. This system is entirely confined to logic and dialectic. It is therefore more in accordance than the Sânkhya with the other systems; and as the natives of India generally have bestowed much labour on logic, so philosophers of all the different sects have occupied themselves with it. The number of the Nyâya writings is very great. The *Vaiseshika* system may be looked upon as a reformation of the Nyâya. It is derived from Kanada. It applies the logical principle to nature, and has arrived at a complete atomic doctrine by the resolution of all substances into their elements. It asserts that there is a union of atoms, which however is purely mechanical; so that, contrary to the Sânkhya, in its consequences it necessarily leads to materialism.

The third system, the *Mimânsâ*, is directly opposed to the two former. It maintains religion and the revealed word of the Vedas, and is a positive theological system. Accordingly it is occupied chiefly in commenting upon the Vedas, and in reconciling their contradictions. The first part of this system is predominantly practical; it is called 'Pûrvamimânsâ,' 'the first Mimânsâ;' here also it is affirmed that the final deliverance must be worked out by knowledge, but it limits the knowledge to the duties prescribed in the Vedas. The metaphysical part of this system is displayed in the *Uttaramimânsâ*, commonly called the *Vedânta*. Here too knowledge is considered as the condition of deliverance, but still the sacred word of the Vedas is the great rule by which all thought is to be regulated. The Vedânta required philosophy and dialectic, and has therefore adopted from the other systems everything not contradictory to its objects; the consequence of which is, that one-half of the philosophy is given up, and the Vedânta is intermediate between philosophy and dogmatism.

The Vedas were written in a language which soon became obsolete. The necessity of defending them against corruption and innovation, and of preserving their correct interpretation, led to grammatical inquiries; and as the Sanscrit language is so original, regular, and perfect, that its laws are easily discovered, philology has become the most valuable part of Indian literature. The Indian grammarians are far above those of any other ancient people. *Grammar* they have treated of in numberless writings. The first beginnings of Sanscrit grammar reach back to very remote times, and are included in the collected system of the Vedas. The oldest grammarians appear also as the authors of the 'Upanishaden.' The system appears at once in its complete state in the 'Sûtras,' or Aphorisms, of Pânini, who certainly lived in the middle of the fourth century before Christ. He takes notice of a series of older grammarians, as well as of schools; and though there was some variation in what they taught, the general system was the same, and they had the same technical terms. The form in which grammar is presented is peculiar to the natives of India, and they apply the same principles to other sciences. Everything is compressed into rules, which are brought into the most concise forms of expression possible, and the grammatical categories are expressed by a kind of figures or algebraical signs. They are intended to be committed to memory, and without a commentary they are unintelligible. Pânini is indeed very arbitrary in arrangement, which appears to have been adopted merely from the necessity which the object of attaining the greatest possible brevity imposed upon him. The whole of modern Sanscrit grammar is founded on Pânini. Two ancient commentaries by Kâtyâyana (who is also called Vararuchi) and by Pâtânjali, who in later times have themselves been copiously commented upon, are as old as Pânini. In comparatively recent times, grammarians began to take some pains to reduce the 'Sûtras' to a system, and to compose grammars more in accordance with European notions. Here the 'Siddhântakaumudî' must be particularly mentioned, which was written by Bhattojidîkshita about the year 1600, and has served as the foundation of a number of more modern works. ('Siddhântakaumudî,' Calcutta, 1812, 4to.; 'Laghukaumudi,' ibid., 1827.) All these are entirely occupied with teaching the grammatical forms, and it is only as opportunity offers that they give a few syntactical rules. Syntax, on the contrary, is developed in many distinct works, and is grounded on the logic of the Nyâya system, which is a proof of enlarged and correct views. So in like manner the different Pracrit dialects have been exhibited in their separate grammars.

Lexicography had its origin as far back as the Vedas, for the necessity must soon have been felt

of collecting and explaining the obsolete words. A work of this kind, entitled 'Nirukta,' forms an essential part of the Vedas themselves. The lexicon and that which has served as a foundation to all the later ones, is the 'Amarakosha' ('Amarasinha'), which they have imitated even in their arrangement. [AMARA.] None of these works, of which there are many, exhaust the treasures of the language. Besides the works enumerated there are treatises in Sanscrit on metre, music, rhetoric or rather poetry, and commentaries on the more ancient works.

The oldest Indian *astronomical documents* are the calendars which are annexed to the Vedas, and which, according to Colebrooke, belong to the 13th century B.C. They include a solar year of 365 days. Here also we are unable to point out how the mathematical and astronomical sciences were gradually developed from such simple elements, for we possess them only in their perfected form. Assisted by the system of notation which they discovered, the natives of India have been particularly happy in their methods of treating arithmetic and algebra. ('Lilâvatî,' by Bhâskara, Calcutta, 1828; Colebrooke, 'Algebra of the Hindus,' Calcutta, 1817, 4to.) As to the Indian Astronomy, see ASTRONOMY, and the references in that article.

It was the chief business of Hindoo *jurisprudence* to determine accurately the contents of the ancient law-books and to complete them. This was done partly by commentaries (especially Kullûkabhatta on Manu, and Paradatta on the 'Yájnavalkya'), and partly in special works, which for practical purposes must have soon superseded the imperfect and unsystematic 'Sâstras.' The wants of the present age have occasioned the printing of a small number of these works, chiefly on the law of inheritance and adoption, and on procedure; others have been translated into English. Besides Manu, which was translated by Sir William Jones, Colebrooke's 'Two Treatises of Inheritance' (Calcutta, 1810, 4to.), and his 'Digest of Hindu Law on Contracts and Successions,' 1797, which is translated from a modern compilation, particularly deserve mention.

There are many Indian works on *medicine*. Many parts of the medical science of India are valuable even to us, as for instance the Materia Medica. In surgery they have made considerable progress, and have even discovered and performed difficult operations, as for instance the restoring of noses. The most celebrated medical work, 'Susruta,' has been printed (Calcutta, 1835, 2 vols. 8vo.); and Ainsley, and more recently Royle, have done much to make known the Indian systems of medicine.

Towards the close of the last century the study of the Sanscrit language received a powerful impulse, partly from the necessities of the English government in India, and partly from a desire of knowledge among the learned of Europe. The study of the language having been once commenced, its progress was extremely rapid, the acquisition of it being much facilitated by the previous labours of native grammarians; and by the printing of a great number of their most important works, a large part of the literature became generally accessible, an advantage which the other oriental languages have not enjoyed. In India this progress has been connected with the names of Wilkins, Jones, Colebrooke, Wilson, and Prinsep. But Europe did not remain behind; and the rich collection of manuscripts in the possession of the East India Company in London, and that of the library of Paris, have been abundant sources, and perhaps more than sufficient to compensate for the peculiar advantages enjoyed by India. In England, the study of Sanscrit is most indebted to Haughton and Rosen; in France, where it was chiefly introduced through Hamilton in 1804, to Chézy and Burnouf. In Germany Sanscrit has experienced the most cordial reception, though, owing to the want of manuscripts, the study of it has been prosecuted under the greatest disadvantages. In that country, the knowledge of Sanscrit has been chiefly diffused by A. W. von Schlegel and Bopp, both of whom learnt it about the same time in Paris. The latter however has only had in view comparative grammar, a science which has been called into existence by the study of Sanscrit. But A. W. von Schlegel and Lassen have founded in Bonn a Sanscrit school, the object of which is a well-grounded and complete knowledge of the language as well as of the literature and antiquities of India. In the University of Oxford a professorship of Sanscrit was founded in 1830.

SANSEVIE'RA, a genus of Liliaceous plants, found on the coast of Western Africa, of Ceylon, and other Eastern islands, as well as of India, remarkable for the strength and fineness of the fibres of their leaves. *Sanseviera zeylanica*, a species found in Ceylon, is remarkable for the tenacity and fineness of the fibres of its leaves. *S. Roxburghiana* is a species, according to Mr. Haworth, which was confounded with the former by Dr. Roxburgh, and which the latter has figured in his Coromandel Plants. In a good soil, and where the plants are regularly watered, the leaves become three or four feet long, and contain a number of fine remarkably strong white fibres, which run their whole length. The natives make their best bow-strings of these fibres, which are separated by the leaves being placed upon a flat strong table, when one end is pressed down with the foot, and the rest scraped with a piece of hard wood held in both hands. Forty pounds of leaves thus scraped yield about one pound of clean dry fibres. *S. lanuginosa* is a third species, found on the sands of Malabar. This has been proposed as a substitute for and considered even superior to New Zealand Flax.

SANSON, NICOLAS, was born at Abbeville, Dec. 20, 1600. His father, of the same name, was passionately fond of geography. Nicolas was educated at the Jesuits' college at Amiens, on leaving which he devoted himself wholly to the study of geography. At an early age he laid down a map of ancient Gaul, superior to those of Ortelius and Gerard Mercator. The talent displayed in this production, which was published at Paris in 1627, obtained for him the patronage of Richelieu, by whom he was introduced to Louis

XIII., who took lessons in geography from him, and employed him as an engineer in Picardie. His duties did not diminish his zeal for geography, and about 1640 he established himself at Paris to superintend the publication of his maps in person. Soon after this he received the brevet of geographer to the king, and a pension of 2000 livres. He was also made a counsellor of state, but did not assume the rank and titles of that office, lest his children should be induced to abandon the study of his favourite science. His incessant labours brought on an illness, of which he died at Paris, July, 1667.

The maps of Sanson are very numerous, amounting, it is said, to about three hundred, of which a great number were devoted to an accurate delineation of France. He published many works to accompany his maps, and others on geographical subjects. His maps were published in two folio volumes, in 1693.

Adrien, his second son, succeeded his father as geographer to the king, and died in 1718. Guillaume, the youngest, in concert with his brother, continued the publication of maps and geographical works, and died in 1703. Adrien was succeeded in the business of publication by his nephew, P. M. Sanson.

SANSOVI'NO, JA'COPO TATTI. This eminent sculptor and architect was born at Florence in 1479. He was the son of Antonio Tatti, whose surname he afterwards exchanged for that of his master, Andrea Contucci da Monte Sansovino. He was probably indebted to Giuliano Sangallo for his first instruction in architecture. This was at Rome, which he visited at an early period of his career. On his return to Florence he produced his Bacchus, a chef-d'œuvre in modern sculpture, but now known only from drawings and copies, it having been destroyed by a fire that broke out (1762) in the gallery at Florence. He returned to Rome a second time, but quitted it for ever on the city being taken and sacked by the Imperial troops in 1527, and retired to Venice, where he erected a great number of structures, among which are San Giorgio de' Greci, La Scuola della Misericordia, the Palazzo Cornaro a San Maurizio (one of his best works), San Francesco della Vigna, the Mint, the Public Library, the Loggia del Campanile, Palazzo Delfino, Fabbriche Nuove di Rialto, &c. His professional reputation was at one time in great jeopardy, for scarcely was the vaulted ceiling of the Public Library completed, when it fell down, in consequence of which he was imprisoned and fined, but was soon liberated and restored to his former office. He had not meantime entirely neglected sculpture; he executed the two colossal figures which have given name to the 'Giant's Staircase' of the ducal palace. He died Nov. 27, 1578.

SANSOVINO, FRANCESCO, supposed to have been the illegitimate son of J. T. Sansovino, was born at Rome in 1521. He was educated to the law, took his degree at Padua, and began to practise at the bar in Venice, but with little success. He afterwards devoted himself to literature. The works by which he is now chiefly remembered are his 'Description of Venice,' and the 'Cento Novelle scelti de' piu nobili Scrittori della Lingua Volgare;' which last has been frequently reprinted. Francesco Sansovino died at Venice, Sept. 28, 1583.

SANT'ANASTASIA. [Naples, Province.]

SANTA CRUZ. [Mexican States.]

SANTA FE. [Plata, La.]

SANTA FE DE BOGOTA'. [Bogota'.]

SANTA MARIA DE BETANCURIA. [Canaries.]

SANTA MAURA. [Ionian Islands.]

SANTALA'CEÆ, a natural order of plants belonging to the class of Exogens and subclass *Incompletæ*. They are trees, shrubs, or herbaceous plants, with round or irregularly-angled branches; alternate or nearly opposite undivided leaves, sometimes minute, and resembling stipules. In the form of weeds the genera of *Santalaceæ* are found in Europe and North America; in Australia, the East Indies, and the South Sea Islands, they exist as large shrubs or small trees.

The *Osyris* belongs to this order, but is a different plant from the *Osyris* of Pliny, which possessed in former times a reputation for curing every disease. The modern genus possesses no sensible properties as a medicine, and is principally employed for the manufacture of besoms, for which its long slender branches well fit it.

SANTALIN, the colouring matter of the *Pterocarpus santalinus*, or Red Sandal-Wood. It has a beautiful red colour; it is tasteless, nearly insoluble in water, but dissolved by alcohol, æther, alkaline solutions, and slightly by the oils of lavender and rosemary. It consists of C^{16} H^{8} O^{3}. Santalin is little used in this country as a dye stuff, but in India it is employed both in dyeing silk and cotton. It is used in pharmacy to give a colour to certain tinctures, but the colour is not generally regarded as a permanent one.

SA'NTALUM, a genus of plants which gives its name to the natural order *Santalaceæ*, to which it belongs. Sandal Wood yielded by one or more species of *Santalum* is well known both in commerce and the arts as a fragrant-smelling wood, whence it is used as incense, and employed in the manufacture of necklaces, fans, elegant boxes, and cabinets. It is a product of the Malabar coast of India, as well as of the Indian Archipelago.

Santalum album, or the White Sandal Wood, is a native of the mountainous parts of the coast of Malabar, and also of Timor and the islands of the Indian Archipelago. It forms a tree of moderate or rather of small size, but much branched, and in general appearance has been often compared to the myrtle. The tree when felled is about nine inches or a foot in diameter; it is then barked, cut into billets, and said to be buried in a dry place for about a couple of months. The deeper the colour and the nearer the root; the more fragrant it is. As seen in commerce it is in compact pieces of a white colour and agreeable odour, but with little taste. It is usually described as being the young and outer wood, that the inner parts, as they become older, become coloured towards the centre; and that this is the source of the Yellow Sandal-Wood, while the White Sandal-Wood consists of the outer and younger wood of the same tree.

S. myrtifolium is another species, or a strongly-marked variety of *S. album*, found by Dr. Roxburgh in the mountains of the Rajamundry Circar, in Hindustan.

SANTANDER. [CASTILLA-LA-VIEJA.]

SANTAREM. [ESTREMADURA, *Portuguese.*]

SANTIAGO. [CAPE VERDS; COMPOSTELA; PLATA, LA.]

SANTIA'GO, the capital of the republic of Chile, in South America, is situated near the left bank of the Maypu, in 33° 26½′ S. lat., 70° 44′ W. long., in a vast plain extending from the Andes to the Cuesta-de-Prado, a range of hills which divides it from the Pacific. It is one of the finest cities in America in respect to buildings, convenience, and health. It stands on a very gentle slope, and is regularly laid out in rectangular and equal squares. The eight principal streets are crossed by twelve others, all of the width of 45 feet. The streets are paved with small round stones, and have a gutter in the middle, through which a current of water, flowing from the Mapocho, a torrent that skirts the town on the north, is suffered to run during two hours in the day, by which means the streets are kept clean. Most of the streets have side pavements of red porphyry. The houses are usually only one story high, on account of the earthquakes, but they are very large, and contain many rooms, arranged round three squares, called patios. The front of the houses along the street is occupied by small rooms, which have no communication with the interior of the house, and serve as shops for mechanics and retailers. The walls of the houses are four feet thick, built of large bricks made of baked mud, and all are whitewashed or painted. The roofs are of red tiles.

The great square, which is adorned with a handsome bronze fountain in the centre, has on one side the government palace, the prison, and the chamber of justice: opposite stand the cathedral and the bishop's palace; the other two sides are occupied by shops and private residences. The palace is an extensive building, in the Moorish style, of which it is a good specimen. The cathedral is the only stone building in Santiago. The other public buildings of the town are in a good style, but they are small, with the exception of the Mint, which occupies a whole square, and is two stories high. There are also several handsome churches and convents in Santiago.

At the eastern extremity of the town is a small rocky eminence, on which the fort of Santa Lucia is built. Adjacent to the hill on the north is the Tajamar, or breakwater, a piece of strong mason-work two miles long, which protects the town from the inundations of the Mapocho. At the western extremity of the Tajamar is a handsome bridge over the Mapocho, of eight arches, which leads to the suburb of Chimba. Along the south-western side of the city is a public walk, called la Cañada, which is planted with magnificent poplars, and watered by canals of clear running water. The Cañada separates the city from the suburb of La-Cañadilla. The inhabitants, who number about 70,000, are nearly all of pure European blood. The town has a college, and a great number of schools.

Coarse ponchos and saddlery are the chief manufactures. The exports, consisting of gold, silver, copper, jerked beef, hides, and fruits, are sent to Valparaiso, from which place it receives the manufactures of Europe, China, and the East Indies, with sugar, cacao, and some other of the products from Peru and Central America. A good road leads from Santiago to Valparaiso, a distance of 90 miles. Two roads, carried over lofty passes of the Andes, connect Santiago with Mendoza, on the eastern side of the great chain. By these roads Santiago receives mules, hides, soap, tallow, dried fruits, and wine from Mendoza.

SANTILLANA. [CASTILLA-LA-VIEJA.]

SANTO TOMÉ. [ANGOSTURA.]

SANTOÑA. [CASTILLA-LA-VIEJA.]

SANTONIN, a vegetable principle possessing acid properties, obtained from the seeds of the *Artemisia santonica*, or Southernwood. It is colourless, destitute of smell, and when long chewed is slightly bitter. With some bases it forms neutral and crystallizable salts; this is the case with santonate of soda and santonate of lime. Santonin is supposed by Liebig to consist of C^{60} H^{36} O^{12}.

SANTORIN. [THERA.]

SANZ, AUGUSTIN, a Spanish architect, was born at Saragossa, Dec. 29, 1724. He was indebted for the best part of his instruction to Ventura Rodriguez. In 1775 he was elected a member of the Academy of St. Ferdinand, and on the establishment of that of San Luis in 1792, Sanz was appointed director. In this capacity he did much towards eradicating the corrupt taste of the preceding period, and towards introducing a better style. Among the buildings erected by himself the principal are, the church of Santa Cruz, Saragossa (of the Corinthian order, and forming a Greek cross in its plan), and those at Urrea and Binaces, both of them built at the expense of the Duke de Hijar. He died July 25, 1801, and left a son, Matias Sanz, who was also an architect, and who completed the façade of the church at Epila, begun by his father.

SAÔNE-ET-LOIRE, a department in France, formed out of a portion of Bourgogne, and named from the two rivers that drain it, is bounded N. by Côte-d'Or, E. by the departments of Jura and Ain, S. by those of Rhône and Loire, and W. by those of Allier and Nièvre. Its greatest length from N. to S. is 68 miles, from E. to W. 85 miles. The area is 3307 square miles, and the population in 1846 was 565,019; giving 170.855 to the square mile, or 2.9 below the average per square mile for all France.

The department is traversed from N. to S. by the Cévennes Mountains, which here form the watershed between the Atlantic and the Mediterranean. In the south of the department, these mountains consist of several parallel chains separated by longitudinal valleys, and reach the height of about 3000 feet above the sea; but they diminish rapidly in height and also in breadth in their advance northwards, and terminate in the

valley of the river Dheune, which divides the Cévennes from the mountains of Côte-d'Or.

From the Cévennes, numerous offshoots branch off eastwards, dipping into the valley of the Saône at some distance from the river, except in the arrondissement of Mâcon, where, between the Grône and the Saône, the hills here and there extend to the right bank of the latter. The Saône crosses the north-east of the department, receiving the Doubs and the Seille on the left bank, the Dheune and the Grône on the right bank; it then runs S. along the eastern boundary of the department, receiving in this part of its course no tributary of importance from the right bank. Indeed the Grône, which rises near Beaujeu in the department of Rhône, runs for almost its whole length through a narrow valley between wooded hills, in a northern direction, parallel to and about 12 miles W. of the Saône, and receives most of the mountain streams in this portion of the department. The arrondissement of Louhans, watered by the Seille, which is rendered navigable by sluices from Louhans to its mouth, and a great part of the arrondissement of Châlon are level and produce a great deal of corn and hay. Along the Doubs, the frequent floods in which are prevented by dykes from overflowing the plains, and along the Saône, there is a great deal of excellent pasture and meadow land. The arrondissement of Mâcon is hilly, and more than two-thirds of its surface are under vines, so that its inhabitants are obliged to import corn. About 18,400,000 gallons of wine are made annually in the whole department; the best kinds are those grown near Romanèche in the arrondissement of Mâcon, near which there is also the richest manganese mine in France.

The western division of the department consists chiefly of the basin of the Arroux; it extends between the Cévennes and the Morvan Hills, which last spring from the mountains of Côte-d'Or, and inclose the basin of the Arroux on the north and west. The Arroux is navigable only from the bridge of Toulon to its entrance into the Loire near Digoin; it is available for floatage however from Autun. The Loire crosses the south-western angle of the department, and then forms the boundary between Saône-et-Loire and Allier. The southern part of this division forms the arrondissement of Charolles, which includes the western slopes of the Cévennes, and contains abundant pasture and some good corn land; but the arrondissement of Autun, and the basin of the Arroux, generally has a poor arid soil, which yields little else than grass, rye, and potatoes. In the north-west of the department however, on the slopes of the Morvan Hills, there are some fertile lands, and many most picturesque dells opening among wooded hills whence the clear feeders of the Arroux descend; in this district also, there is a fine breed of cream-coloured oxen, and the fields are generally inclosed by hedgerows.

But though the surface of the basin of the Arroux has in general an ungrateful soil, it covers one of the richest coal fields in France. Fifteen mines are worked; and in their neighbourhood are numerous iron works, the ore used in which is partly mined in this district, but most of it is the produce of distant mines. At Creuzot, where iron and coal mines are worked, is one of the most important iron works in France, and great foundries in which cannon, anchors, steam machinery, mill castings, &c., are manufactured. The canal du-Centre, which leaves the Loire by the Arroux at Digoin, runs up the valley of the Bourbince, is carried by locks over the Cévennes (from lakes on the very crest of which it receives a supply of water) into the valley of the Dheune, and ultimately joins the Saône at Châlon, affords an outlet for the coal, iron, and other products of the department into the Loire and the Rhône; while a railroad from Épinac to the canal de-Bourgogne opens a ready communication with the Seine. The total length of navigation afforded by the Saône, the Loire, their feeders, and the canal before mentioned, amounts to about 270 miles.

There are large forests of oak, elm, beech, and fir, in the Morvan and Cévennes ranges, and in several other districts; in the eastern division of the department the forests contain also maple and poplar. The bare sandy flats that formerly occurred at intervals along the banks of the Saône are now covered with pine plantations. Besides wine the agricultural products include wheat, rye, maize, some oats, potatoes, and hemp. Horned cattle are numerous; in the pastures of the Charollais large numbers are fatted for the Paris market; oxen are used in the plough. Horses are small in size; sheep and swine are reared in considerable numbers. Wolves and wild boars are met with in the Cévennes. Game and fresh water fish are abundant.

To the industrial products of the department already mentioned are to be added steel and steel ware, glass bottles, copper ware, paper, beet-root sugar, pottery, bricks, cotton cloth and yarn, linen, leather, felt hats, drugget, plaids, wine casks, oil, flour, &c. The total number of iron works in the department is 14; of wind and water mills, 1150; and of factories and workshops of different kinds, 431.

The department is traversed by 7 national, 21 departmental, and a great number of parish roads; it is also traversed in its whole length by the Paris-Avignon railway, now open nearly all the way from Paris to Châlon, whence to Lyon it runs at a little distance from the right bank of the Saône through Mâcon.

The department contains 2,116,465 acres, distributed among 153,266 proprietors, and into 1,555,723 parcels. Of the whole area, 1,127,639 acres are arable land; 312,983 meadow and pasture land; 93,745 under vines; 415,567 are covered with woods and forests; 64,914 acres consist of heaths and moors; 11,557 are occupied as gardens, nurseries, and with various culture; 61,637 acres with roads, streets, squares, and buildings; 27,847 acres consist of rivers, canals, and ponds; and 573 acres are taken up with churches, public buildings, and cemeteries.

The department is divided into 5 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Mâcon . .	9	135	119,950
Autun . .	8	87	97,089
Charolles .	13	138	128,332
Châlon . .	10	155	131,314
Louhans .	8	82	88,334
Total . .	48	597	565,019

Of the arrondissement of Mâcon, and of the whole department, the chief town is MACON. *Chapelle-de-Guinchay*, which gives name to the canton south of Mâcon, has only 2000 inhabitants; in this canton is *Romanèche*, a village of 2300 inhabitants, which gives name to the famous wines of the neighbourhood; there are manganese mines near it. *Cluny*, 12 miles N.W. from Mâcon, is situated in a narrow valley traversed by the Grône, and shut in by two ranges of wooded hills. It is an ancient place, and still retains traces of its old fortifications. William I., duke of Aquitaine, founded an abbey in Cluny in the year 910, which became the chief house of the order of St. Benedict. The abbey buildings, including one of the largest and finest gothic churches in Europe, were destroyed at the Revolution of 1789; the abbot's house alone escaped, and is still standing. The present town, part of which is built on the site and with the materials of the abbey buildings, has a college, and 4185 inhabitants, who manufacture drugget, steel-ware, vinegar, paper, earthenware, tiles, and leather. *Tournus*, a considerable manufacturing town 17 miles N. from Mâcon, stands in a fertile district on the right bank of the Saône, which is here bordered with a handsome quay, and traversed by a bridge of five wooden arches resting on cut stone piers. Before the first French revolution there was a fortified abbey here, built on the spot where St. Valerien was martyred; it afterwards took the name of St. Philibert. The abbey-church which escaped demolition in 1793, the Hôtel-Dieu, the poor-house, founded in 1718 by Cardinal Fleury, the town-hall, and the house of correction, are the chief buildings. The town, which is said to occupy the site of an Æduan or Roman town, has a tribunal of commerce, and 5267 inhabitants, who manufacture blankets, calicoes, swanskin, hats, potash, beet-root sugar, and tiles; and trade in corn, wine, building stone, &c.

The arrondissement of Autun takes its name from its chief town, AUTUN. *Couches*, an ancient town 13 miles S.E. from Autun, has 3050 inhabitants, many of whom are employed in the neighbouring iron works and iron mines. *Epinac*, situated in a rich coal field 10 miles E. from Autun, has 2803 inhabitants, who are engaged in mining coal, and in the manufacture of beet-root sugar, bar iron, and glass bottles. *Issy-l'-Evêque*, 22 miles S. by W. from Autun, has a population of 2000. *Montcenis*, an historical place, with a population of only 1508, commanded by the ruins of an old castle of the dukes of Bourgogne, is 15 miles S. by E. from Autun. A little north of Montcenis is *Creuzot*, a village on the great coal field before mentioned, which has 4012 inhabitants.

The arrondissement of Charolles is named from its chief town *Charolles*, the capital of the Charollais, which stands between two hills at the junction of the Semence and the Arconce, 28 miles W. by N. from Mâcon, and has tribunals of first instance and of commerce, a college, and above 3000 inhabitants. It is pretty well built; on one of the hills above it are the picturesque ruins of an old castle, and in the environs numerous iron works. *Bourbon-Lancy*, famous since Roman times for its hot springs and baths, stands on the slope of a hill near the right bank of the Loire, 27 miles N.W. from Charolles, and has 2879 inhabitants. *Chauffailles*, a few years ago a mere village, now an active town with 3570 inhabitants, and considerable linen and cotton manufactures, is 17 miles S. from Charolles. *Digoin*, situated on the right bank of the Loire, at the junction of the canal-du-Centre, which joins the Loire and the Saône, is an entrepôt for a great part of the wines of the districts about Châlon and Mâcon, and has 3100 inhabitants, who manufacture porcelain, build barges, and trade in salt. *Marcigny*, 16 miles S. by W. from Charolles, is situated in a narrow valley that opens into the Loire; it has a population of 2486, who manufacture table-linen, build boats, and make tiles and earthenware. *Paray-le-Monial*, a well-built town with 3384 inhabitants, stands near the canal-du-Centre, midway between Charolles and Digoin. The parish church, a fine gothic edifice founded in 1004, has been classed among the historic monuments of France. *Toulon-sur-Arroux*, 20 miles N.N.W. from Charolles, is situated in a fertile well-cultivated district on the Arroux, which is here crossed on a bridge of 13 arches. The town, which is said to occupy the site of the *Telonnum* mentioned in the Theodosian Table, has a population of 2337, and some trade in corn, cattle, and timber.

Of the arrondissement of Châlon the chief town is CHALON-SUR-SAÔNE. *Buxy*, 9 miles S.W. from Châlon, situated in a good white-wine district, has 2000 inhabitants. *Chagny*, an ancient well-built little town, 10 miles N.W. from Châlon, situated on the Dheune, near the canal-du-Centre, has 2926 inhabitants; there are large quarries of excellent stone near Chagny. *Givry* is a pretty town of 2938 inhabitants, situated 6 miles W. from Châlon near a forest of the same name, and in a good wine district. The town, which was formerly strongly fortified and entered by four gates, consists of straight and regular streets, abutting on a central square adorned with a fountain. Wine casks and leather are the principal industrial products; a soft stone, which hardens by exposure to the air, is quarried here. *Sennecey-le-Grand*, 9 miles S. from Châlon, has a population of 2638. The old castle built by Toulongeon, marshal of Bourgogne, with the ransom of the constable of Scotland, whom he made prisoner at the battle of Cravart in 1422, was finally demolished in 1833. *Verdun*, a town formerly rich in historical memorials, built on an ancient Roman site, is situated at the confluence of the Saône and the Doubs, partly on a hill and partly in a fertile plain, which is surrounded by a double line of dykes to protect

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it from the inundations of these rivers. The town was many times stormed and sacked in the wars between the French and the Burgundians. In the wars of the League it was taken in 1589, but recovered the same year for Henri IV. by De Bissy; in 1686 again it was taken, pillaged, and burnt by the Imperialists and the Francs-Comtois under General Gallas. Verdun retains not a trace of its strong citadel and fortifications; the former was destroyed by Henry IV., the latter by Louis XIV.; several buildings were also swept away by the revolutionary violence of 1793. The population is 2050.

The arrondissement of Louhans is named from *Louhans*, an ill-built town traversed by the Seille, the Salle, and the Solnan, 19 miles S.E. from Châlon. The town has tribunals of first instance and of commerce, a college, a very singular old church, a well-endowed hospital, and 3686 inhabitants. The Seille is rendered navigable from Louhans by means of sluices; charcoal, stone, corn, wood, iron hoops, wine casks, and vine poles, are the principal articles of the river traffic. Louhans has several tan yards and flour mills; its trade in flour, poultry, fat pigs and cattle is considerable. *Cuiseaux*, near the foot of the Jura, 13 miles S.E., and *Cuisery*, on a hill above the Seille, 13 miles S.W. from Louhans, are small places with under 2000 inhabitants each. *St. Germain-du-Bois*, 6 miles N., and *Montpont*, 6 miles S. from Louhans, have each a population of above 2500. *Pierre*, an ancient village 12 miles N. from Louhans, has 2000 inhabitants, and is famous for the castle of the ancient family of Thiard de Bissy, which is one of the finest old castellated mansions in France.

The department forms the see of the bishop of Autun; it is included in the jurisdiction of the High Court and of the University Academy of Dijon, and in the fifth military division, of which Besançon is head-quarters. Under the late monarchy it returned 7 members to the Chamber of Deputies; it now has 12 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850.)

SAÔNE, HAUTE, a department in France, formed out of the northern portion of Franche-Comté, and named from its position in the upper part of the basin of the Saône, is bounded N. by the department of Vosges, E. by Haut-Rhin, S. by Doubs, and W. by Côte-d'-Or and Haute-Marne. Its greatest length from N.E. to S.W. is 70 miles, its greatest breadth 38 miles. The area is 2050 square miles, and the population in 1846 was 347,096, which gives 169.31 to the square mile, or 4.44 below the average per square mile for the whole of France.

The east of the department is occupied by the Vosges mountains, which rise in the Ballon de Lure and the Ballon de Servance to the respective heights of 4264 and 4100 feet above the sea. Ranges of hills branching from the Vosges run S.S.W. along the right bank of the Ognon; and branches of the Faucilles mountains, which form part of the watershed between the North Sea and the Mediterranean, cover the north-western districts. The mountainous regions abound in forests of oak, fir, beech, ash, &c., and are covered in many parts with good summer pasture. The high valleys, which are generally traversed by a mountain torrent, here and there forming a cascade, have mostly an arid, stony and unproductive soil. Minerals however are abundant, including red and gray granite, green and violet porphyry, freestone, lithographic stone, grindstone, gypsum, white sand used in glass factories, limestone, marble, and iron. Several iron and coal mines are worked. The mineral springs of Luxeuil are the most frequented.

The rest of the department presents a pleasing variety of hill and dale, fertile fields, extensive pasture and meadow lands fertilized by the overflows of the Saône and the Ognon. The hills are covered with woods and vineyards. Corn more than enough for the consumption, vast quantities of cherries for making kirschwasser, various other fruits, maize, barley, rye, some oats, millet, beetroot, pulse, oleaginous seeds, potatoes, hemp, flax, &c., are produced. Horned cattle, horses, goats, pigs, asses, and poultry, are bred in considerable numbers; there are but few sheep. Among the wild animals are wolves, boars, foxes, deer, hares, &c. Game and fresh-water fish are abundant. Some bad brandy, and about 8,000,000 gallons of inferior Burgundy wine, are made annually.

The climate of the department is mild, but variable. The principal river is the *Saône*, the ancient *Arar*, which rises in the department of Vosges near Darney, and enters Haute-Saône near Jonvelle. Hence it runs in a general southern direction, through this department, past Gray; across the south-eastern part of Cote-d'Or, passing St.-Jean-de-Losne; it then enters Saône-et-Loire, in which it passes Châlon, and reaches the department of Ain a little below Tournus; from this point to its junction with the Rhône at Lyon its course is nearly due S. past Mâcon and Villefranche, between the department of Ain and those of Saône-et-Loire and Rhône. Its whole length is 280 miles; 162 of which, from Gray to Lyon, are navigable. Steamers ply between Lyon and Châlon. During the freshes in the river, caused by the melting of the snow on the mountains, great numbers of rafts made of squared timber, and loaded with oak staves, iron, bottles, grindstones, and various other articles, are floated down to Gray from Jonvelle and intermediate places. Near St.-Jean-de-Losne it is joined on the right bank by the canal de-Bourgogne, which connects it with the Seine, and on the right bank by the canal du-Rhône-au-Rhin. The fall is very gradual; it overflows its banks periodically; the floods are not disastrous, but highly beneficial to the low pasture and meadow land that fringes its banks. Its principal feeders in this department are—on the right bank, the Amance and the Saulon; on the left bank, the Coney, the Lanterne, the Durgeon, and the Ognon, which last for a long way divides Haute-Saône from Doubs and Jura.

The chief industrial product of the department is iron, in the various forms of pig, bar,

sheet, tin plates, steel, wire, or articles of iron-mongery. This manufacture is carried on in 60 forges, furnaces, and foundries. The other industrial establishments include glass-works, potteries and brickfields, distilleries, tan-yards, cotton and paper-mills, dyehouses, 873 wind and water-mills, several oil mills, &c. Straw and felt hats, hosiery, drugget, and hempen cloth are also made; and there is a good trade in corn, flour, hay, timber, oak staves, deals, butter, cheese, salt, and cattle. About 400 fairs are held in the year.

The department is traversed by 5 national, 14 departmental, and several parish roads, giving a total length of roadway of about 2000 miles. Its surface measures 1,312,155 acres, distributed among 127,038 proprietors, and into 1,992,741 parcels. Of this area 632,867 acres are arable land; 145,755 pasture and meadow; 29,083 acres are under vine culture; 417,499 consist of woods and forests; 13,784 are occupied as gardens, nurseries, and with various culture; 55,996 acres are heaths and moors; 24,375 are occupied with roads, streets, &c.; 3704 acres with rivers and lakes; and 5177 acres are covered with buildings.

The department is divided into 3 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Vesoul . . .	10	212	114,572
Gray . . .	8	188	89,161
Lure. . . .	10	195	143,363
Total . .	28	595	347,096

Of the arrondissement of Vesoul, and of the whole department, the chief town is *Vesoul*, a clean well-built town, situated at the foot of a conical hill called La Motte, at the junction of two small streams that form the Durgeon, a feeder of the Saône, which winds its way through a fertile basin, shut in by low hills covered with vines. The town, which stands in 47° 37′ 26″ N. lat., 6° 9′ 6″ E. long., at a distance of 200 miles S.E. from Paris, has a tribunal of first instance, a college, a primary normal school, a secondary ecclesiastical school, and 6768 inhabitants. The streets are wide and well paved, and the three squares are adorned with fountains. The parish church, court-house, cavalry barracks, prefect's house, the hospital, the theatre, the town house, and the public library with 21,000 volumes, are the most noteworthy objects. Calico, hosiery, and leather are manufactured; wax bleaching and calico printing are carried on; and there is some trade in corn, wine, groceries, iron, nails, hides, and hay. *Jussey*, 18 miles N.W. from Vesoul, is situated in a very hilly country near the right bank of the Amance, and has 2789 inhabitants. *Pont-sur-Saône*, 8 miles W. from Vesoul, stands on the left bank of the Saône, which is here crossed by a handsome bridge. The town has 2148 inhabitants, who manufacture pottery and cards, and build boats for river traffic. *Scey-sur-Saône*, beautifully situated in a fertile territory, clothed with rich pasturages, vineyards, and woods, and watered by the Saône, has iron furnaces, foundries, rolling-mills, tanyards, and 2144 inhabitants. There is a fine bridge of 14 arches over the Saône here, and near it a river harbour, the trade of which adds to the prosperity of the town.

Of the arrondissement of Gray, the chief town *Gray* stands on the northern slope of a hill above the Saône, 30 miles S.W. from Vesoul, in 47° 26′ 48″ N. lat., 5° 35′ 22″ E. long., and has tribunals of first instance and commerce, a college, and 7201 inhabitants. The town, situated on the left bank of the Saône, which is here lined with handsome quays and spanned by a fine stone bridge, is pretty well built and adorned with fountains; but the streets are narrow, irregular, and steep. The cavalry barracks, the town-hall, built in 1568, the court-house, the public library of 4000 volumes, the old castle (a residence of the dukes of Bourgogne) and the great mill of M. Tramoy, are the most noteworthy objects in the town. This mill, which is of elegant construction, and the finest establishment of the kind in France, is driven by a current drawn from the Saône. It contains 11 hydraulic wheels, which drive 11 pairs of stones and a saw-mill; and by ingenious mechanical contrivances, all the various processes in the grinding, sifting, and lifting, of the greater part of the surplus corn of five adjacent departments ground in this vast establishment, are performed with the help of only 15 workmen. The flour from these mills enters largely into the supply of Lyon and Marseille, whither it is conveyed by barges down the Saône and Rhône. Other industrial products are haircloth, point-lace, starch, leather, &c. River barges are built. The town is famous for its corn market; it has also an active trade in oak-staves, wine, hay, timber, planks, &c. Gray has also a considerable transit trade in colonial produce, for which it is an entrepôt, and in all the products of the south of France. *Champlitte*, 14 miles N.W. from Gray, is situated among vine-clad hills that confine a valley watered by the Salon, and has 3084 inhabitants, who manufacture brandy and trade in wine. In the highest part of the town is a fine old château, which now serves for the town-hall. *Gy*, a town of 2660 inhabitants, situated on the slope of a hill among large vineyards, was formerly fortified and defended by a castle, which is still standing. The town stands 11 miles E. from Gray, and has some manufactures of drugget, cotton velvet, and leather.

The arrondissement of Lure takes its name from *Lure*, a town of 3058 inhabitants, with a tribunal of first instance and a college, situated in the middle of a marshy plain, 16 miles N.E. from Vesoul, on the road from Paris to Basel. The most remarkable objects at Lure are—the former abbot's house, now occupied by the sub-prefect; the college buildings, and the avenue on the east side of the town formed of fine poplars, which of course flourish in such a soil. This town is said to occupy the site of an old Roman town. The manufactures consist of hosiery, cotton

tissues, straw hats, and leather. *Champagney*, 8 miles N.E. from Lure, has 3000 inhabitants, most of whom are employed in the important coal mines between this place and *Ronchamp* (population, 1800). *Héricourt*, a bustling little manufacturing town, with 3518 inhabitants, is situated on the left bank of the Lizenne, 15 miles E. by S. from Lure. It is a well but irregularly built town. It has several cotton mills driven, some by the Lizenne, and some by steam; printed cottons, hosiery, cotton handkerchiefs, glue, pottery, beer, tiles, and leather, are the chief industrial products. A great proportion of the inhabitants are Calvinists, who perform their religious ceremonies in the nave, while the Catholics celebrate mass in the choir of the only parish church. *St.-Loup*, a town of 2563 inhabitants, situated at the foot of the Vosges, on the edge of a plain watered by the Seymouse, the Angronne, and the Combeauté, 18 miles N.W. from Lure, occupies the site of the Roman *Castrum Grannum*, which was taken by Attila; after this calamity, the town took the name of St.-Loup from the name of the bishop of Troyes, who had contrived for a time to check the progress of Attila. In 1340 the town was burned by the Burgundians, and again by them under Charles the Rash in 1475. *Luxeuil*, a well-built town, with 4036 inhabitants, is situated 12 miles N.W. from Lure, on the right bank of the Breuchin, here traversed by a fine bridge, which leads to the village of St.-Sauveur. The town is said to owe its origin to its hot mineral waters, known to the Romans, and still frequented. In Attila's invasion the town of Lixovium was utterly destroyed. In 590 St.-Colombanus founded a celebrated abbey and school at Luxeuil, which was frequented by a great number of foreign students. In the eighth century, the Saracens massacred the monks and the townsmen. Charlemagne re-established the monastery, which was often afterwards destroyed and restored; it existed till 1789, and the fine abbey buildings are still standing. Straw hats, kirschwasser, hams, oak-staves, hides, ironmongery, corn, wine, cattle, &c., enter into the trade of the town; near it, there are iron forges and furnaces, wire works and naileries. To the north of this town there are extensive forests. *Melisey* on the Ognon, has a population of 2359. *Villers-Sexel*, a small place of 1400 inhabitants, on the Ognon, has some important iron-works.

The department, together with that of Doubs, forms the see of the archbishop of Besançon. It is included in the jurisdiction of the High Court and of the University-Academy of Besançon; and is included in the 5th Military Division, of which Besançon is head-quarters. Under the late monarchy it returned 4 members to the Chamber of Deputies; it now has 7 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850.)

SAP, in vegetable physiology, is the fluid which plants imbibe from the soil in which they are placed, and is the great source from which they are nourished, and their various peculiar secretions produced. One of the most important conditions of the growth of plants is, that they be placed in circumstances to absorb from the soil those constituents of which their sap is composed. The constituents of sap may be divided into those which are essential, or necessary for the growth of all plants, and those which are special, or necessary only for the growth of particular plants or families of plants. The elementary bodies which form the essential constituents of sap are carbon, oxygen, hydrogen, and nitrogen. These bodies are capable of uniting with each other, and forming a great number of secondary combinations, and are seldom, if ever, absorbed in a pure state by plants. The forms in which they enter the plant and constitute its essential ingredients are those of carbonic acid, water, and ammonia. The sources from whence plants mostly derive these are the soil in which they grow, and the atmosphere. It is not precisely known from which of these two sources plants derive the greatest proportion of the constituents of their sap. The atmosphere appears to be the great source whence the carbonic acid and ammonia is supplied, and the soil would appear to supply the greatest quantity of water. But whatever may be the amount of these ingredients absorbed by plants from the atmosphere through the agency of their bark and leaves, all of them are found to enter the stems of plants through absorption by their roots.

The constituents of the sap which are not necessary for the growth of all plants, are principally the metallic oxides, which it is well known enter very largely into the composition of some plants. The most common of these are the oxides of potassium, sodium, calcium, and magnesium. These oxides occur in combination with various acids, but the acid is not found to exercise so much influence on the plant as the base. Although any of these oxides when presented in solution would be absorbed by plants, it would be only those adapted to the peculiar habit of the plant that would be appropriated. Thus plants which grow naturally on the sea-shore, and require soda for their growth, will take up potassa when presented to them in combination with soda, but they would reject the potassa by excretion and retain the soda. The sap therefore which is found in plants varies in composition both from the nature of the soil and the nature of the plant.

From the soil the sap is conveyed by the roots into the plant, and is not long before it undergoes certain changes in its composition, but the nature of these changes, and the period at which they take place, are not well known. It is however a fact, that the nearer a tree is tapped to its root, the more fluid is the sap which exudes. The channels through which the sap passes in its upward course are also a subject of difficulty. Various observers have contended for each of the different tissues being the sole conveyor of this fluid, but it is most probable that, with the exception of the spiral vessels, which are occasionally appropriated to the conveyance of air, all the tissues of a plant are engaged in conveying sap. There are some parts which seem to convey

more than others, and the younger tissues are always more filled with fluid than the older. Thus, when the trunk of a tree is cut through in spring, sap will be seen to exude from all parts of the cut surface, but in the greatest quantities from the alburnum or sapwood, the most recently-formed portion of the timber.

By whatever channels the sap pursues its upward course, we find that it undergoes great changes between the period of its absorption from the soil and its ultimate disposition in the secretions of the plant. The most important of these changes is the loss of a large portion of that water which it possessed when first absorbed. This water is got rid of by the process of exhalation, which takes place in the leaves. In this way it has been ascertained that a common sunflower, three feet in height, will lose one pound four ounces of water every day; and a common cabbage one pound three ounces. Hales contrived to measure the force with which plants exhaled during the summer, and computed that in some plants it was five times as great as that which impels the blood in the crural artery of a horse. Whilst the sap is in the leaf, an important change takes place which has been called digestion: it consists principally in the decomposition of carbonic acid, the giving out its oxygen into the air, and the combination of the carbon with other elements to form the various secretions of the plant, such as gum, sugar, starch, lignine, &c. The source of the carbonic acid is the atmosphere, which is constantly supplied with carbonic acid from the breathing of animals, the decomposition of vegetable and animal matter, and also volcanic action, and is thus an abundant magazine of food for the vegetable world. In this way plants perform a very important function in the economy of creation. The carbonic acid, which, accumulating in the atmosphere, would become injurious to animal life, is removed; and not only is the noxious ingredient removed, but it is decomposed: and the pure oxygen which it contains, and which is as essential to animal life as carbonic acid is injurious, is given out.

From the period that the sap is absorbed by the roots to the time that the various secretions of the plants are elaborated, it is in a state of constant motion. The motions of the fluid in plants are of two kinds, general and special. The general motions of the sap are those of ascent and descent, both of which may be rendered apparent by cutting through the trunk of a tree, when not only the cut surface below will present an exudation of juice in its ascending course, but the cut surface above will present fluid that is descending. The ascending current seems to depend on the exhalation from the leaves, whilst the descending current is due to gravitation. The agency of light is necessary to the performance of these functions. For other causes of the movement of the sap, see Endosmose.

The special motions of the juices of plants are of two kinds, the first called *Rotation*, the second *Cyclosis*.

Corti first observed a rotatory movement of the sap in the cells of *Caulinia fragilis*, an Italian plant, and his observations were subsequently followed up by Amici, Fontana, and Treviranus, especially the first. It was ascertained by these observers that this motion was not at all confined to the plant in which it was first seen, but that it existed in many others, as *Valisneria*, *Hydrocharis*, *Potamogeton*, &c. But of all the plants in which it exists, it may be seen to most advantage in the *Chara*. Some of the species of this genus are common in Great Britain, and are found inhabiting ponds and ditches. If the cells are examined with a microscope of the $\frac{1}{10}$th of an inch focal length, or even less, the movement spoken of may be easily witnessed. It is then found to consist of the constant motion of a number of little green globules, varying in size, which pass up on one side, and turning round the top of the cell pass down the other side, and again ascend. According to Meyen, these globules are composed of various substances, the larger ones being grains of starch, others little bladders coloured by chlorophyle; and some, drops of oil. The currents which these globules indicate are entirely confined to the cell in which they occur, the motions in one cell not in any manner interfering with those in the next. The motion may frequently be restored after it has stopped, especially in cold weather, by immersing it in warm water. This rotatory motion is not observed in the higher forms of plants, but in these its place appears to be taken by the second kind of special motions, of which we shall now speak, called *Cyclosis*.

Cyclosis is a motion of the fluids of plants which was first described by Professor Schulz of Berlin. It takes place in a peculiar kind of tissue called Cinenchyma, or Laticiferous Tissue. Through this tissue a fluid passes, sometimes clear, but more frequently milky, to which the name of *latex* is given. The latex appears to be a portion of the fluids of the plant more slightly organised, and separated from the rest. It is viscid, insoluble in water, coloured mostly white but sometimes yellow, red, and brown, and is often transparent. It abounds in minute globules which give it its colour, and according to Schulz constitute the living part of the latex.

The cause of these special motions, like that of the blood in the capillaries of animals, is involved in much obscurity. That they should continue, several conditions are necessary, such as heat, light, and all those circumstances essential to the existence of vital irritability in plants, but none of these can be assigned as a true cause.

SAP is a mode of executing the trenches at the siege of a fortress, when the besiegers arrive within such a distance from the covered-way that the fire thence becomes too dangerous to allow the men to work on the ground without being protected by some covering objects, as gabions, placed between themselves and the enemy.

When the distance is about 300 yards, each man brings up, besides a pickaxe and a spade, one gabion, or if possible two gabions. The gabions are placed nearly upright a few inches in front of the tracing-line on the ground, that is, in the direction of the intended trench; and, in part

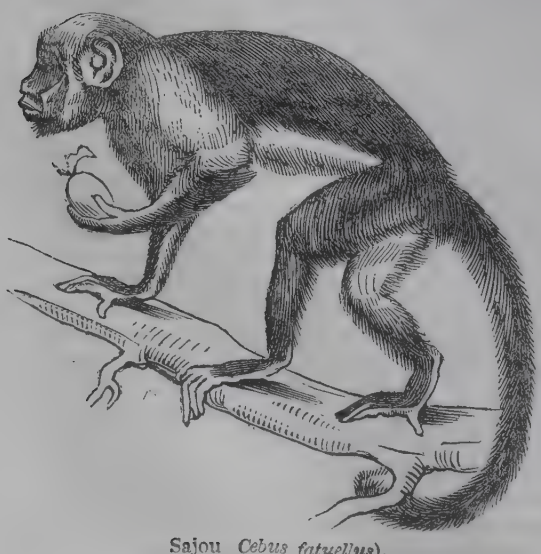
covered by these, each man executes a portion of the trench equal to about 4 feet in length. Two gabions may thus be filled by each man in about a quarter of an hour, and the earth subsequently excavated is thrown towards the fortress, in order to form a parapet capable of resisting a fire of artillery. This is called the Flying Sap, and if the work proceeds during night and day, the parties are relieved every eight hours: a trench executed by flying sap may, in a soil of medium tenacity, be completed by three reliefs of men.

When the men can no longer place the gabions thus openly, what is called the Full Sap is practised. In this work four men only are employed to commence the trench. The first of these, being covered by a mantelet or a large rolling gabion in his front, places one gabion, or two in line, on his exposed side; then, kneeling behind these, he excavates a trench 18 inches wide and 18 inches deep; and, proceeding onwards, setting up other gabions as he advances, a second, a third, and a fourth man successively follows, excavating under the cover of the gabions, when at length the trench is made 4 feet wide and 3 feet deep. The working parties from the infantry of the line afterwards complete the trench by increasing the width to its usual extent, about 12 feet. The work advances about 8 or 10 feet per hour, according to the tenacity of the earth.

When the distance to be passed over is short, the line of trench is carried directly towards the fortress by double sap; two squads of sappers working side by side, and executing traverses at intervals to prevent the trench from being enfiladed.

SA'PAJOUS, the name generally given to a group of South American Monkeys, including in its larger sense the *Ordinary Sapajous* [ATELES; LAGOTHRIX], and the other *Sapajous* (*Cebus*, Geoff.). These last, which are termed *Sajous*, have the head round, the thumbs distinct, but not opposeable on the fore hands, and the tail entirely covered with hair, although still prehensile.

The species are very numerous, and Cuvier truly says that they are nearly as difficult to characterise as those of the American Howlers. [MYCETES.]



Sajou *Cebus fatuellus*).

The whole of the *Sajous* are very active, climb admirably, and are altogether well formed for an arboreal life. The fore hands suffer by comparison with those of the Old World monkeys, and exhibit a less perfect organisation. The palms both of the fore and hinder extremities are endowed with great sensibility. Small in size and playful in disposition, the Sajous lead a gregarious merry life, feeding chiefly on fruits and insects. The facial angle is about 60°.

Examples.—*Cebus albifrons*. Locality, the forests of the Orinoco. *Cebus fatuellus*. Locality, Guiana. *Cebus monachus*. Locality, Bahia. *Cebus capucinus*. Locality, Brazil.

SAPAN-WOOD, a dye-wood which is yielded by a species of *Cæsalpinia*, which grows in India and the Indian Archipelago. The wood has been used as a dye-wood from very early times in India, and is described as a medicine in Persian works. It found its way into Europe some time before the discovery of America, and it still continues to be imported. Its colouring-matter differs little from that of Brazil-Wood, but the best Sapan-Wood does not yield more than half the quantity that may be obtained from an equal weight of Brazil-Wood, and the colour is not so bright.

SAPINDA'CEÆ, a natural order of plants belonging to the calycose group of Polypetalous Exogens. It consists of trees or shrubs, rarely herbaceous plants, with erect or climbing stems, with alternate often compound leaves, rarely simple, with or without stipules, and often marked with lines or pellucid dots. They are inhabitants of most parts of the tropics, more especially of South America and India. They are not found in Europe or the United States of America. One genus is found in Australia, *Dodonea*.

In this order, although the leaves, branches, and other organs act in a deleterious manner, the fruit and seeds are eatable and wholesome. The Litchi and Longan, favourite fruits in China, are produced by the genus *Euphoria*. These fruits are sweet, with a sub-acid flavour, and when dried are sometimes brought to this country. They are considered a great luxury in China. Several other genera bear fruits which are very delicious, and are eaten in Japan and Brazil. The Sapindus is remarkable for bearing a pulpy fruit, the outer part of which has been used, on account of its detergent properties, as a soap. [SAPINDUS.] Some of the species of this genus also produce eatable fruits. *Paulinia* is another genus which has poisonous properties residing in the leaves and other parts of the plant, whilst the fruits are eatable. The whole of the order partakes more or less of these properties.

SAPINDUS, contracted from *Sapo Indicus*, or Indian Soap, and applied to a genus of plants of the natural order of *Sapindaceæ*, which has been so called in consequence of the berries of many of the species being employed for the same purposes as soap. The genus is tropical, containing between twenty and thirty species, which are found in the tropical parts both of the Old and New World. The berries of all the species are red and

saponaceous, on which account they have been employed for washing woollens and clothes of various kinds in different countries. For instance, in the West Indies and the continent of America, *S. saponaria* yields the so-called Soap-Berries. In the East Indies several species, as *S. acuminatus*, *laurifolius*, *emarginatus*, and *detergens*, yield berries which in their dried state may be bought in every bazaar, as they are everywhere employed as a substitute for soap. The fleshy part of these berries is viscid, and in drying assumes a shining semi-transparent appearance. When rubbed with water, they form a lather like soap. This is owing to the presence of a principle called by chemists *Saponine*, which is often united with an acrid principle, whence these berries are said to injure cloth which has been much washed with them. The bark and root have similar properties, and have been employed for the same purpose, as well as medicinally, in the countries where they are indigenous. The berries, which are about the size of cherries, enclose black shining nuts. The kernel of these nuts contains an edible oil, which is sometimes employed for burning. The fruits of *S. senegalensis* and of *S. esculentus* are eaten, and the wood of some species, as of *S. rubiginosus*, is close-grained and hard, and forms valuable timber.

SA'PIUM, a genus of plants belonging to the natural order *Euphorbiaceæ*. *S. aucuparium*, a tree 30 feet high, is a native of the woods of Carthagena. *S. indicum* is a native of the East Indies, and its juice, like that of the former, is highly poisonous.

SAPODILLA. [Sapotaceæ.]

SAPONA'RIA, a genus of plants belonging to the natural order *Cariophylleæ*. *S. officinalis*, Soapwort, is native of many parts of Europe by the road-side, and in Britain in meadows by riversides and under hedges. *S. vaccaria* is native among corn in many parts of Europe, particularly Germany, Switzerland, and the Levant. It derives its specific name from the idea that it increases the lacteal secretion in cows. All the species of this genus are very ornamental.

SAPOTA'CEÆ, or SAPO'TEÆ, a natural order of plants belonging to the polycarpous group of Monopetalous Exogens. The plants of this family are chiefly natives of India, Africa, and America. Some of the species produce fruits which are much prized as articles of diet. Amongst these is the Sapodilla Plum, which is the produce of *Achras sapota*. The Star Apple, Marmalade, the Medlar of Surinam, and other eatable fruits, are derived from plants belonging to this order. Most of the species yield large quantities of a milky juice, which, unlike the secretions of most lactescent families of plants, may be used for alimentary purposes. The fruit and seeds abound in oil, which becomes solid like butter, and has a mild pleasant flavour. The bark of some species of *Achras* is astringent and tonic, and has been recommended as a substitute for quinine.

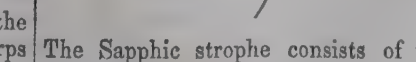
SAPPERS AND MINERS, ROYAL, the non-commissioned officers and privates of the corps of Royal Engineers. They are employed in building and repairing permanent fortifications, in raising field-redoubts and batteries, in making gabions and fascines, in digging trenches [Sap], and executing galleries of mines during sieges, and also in forming bridges of rafts, boats, and pontoons.

The troops belonging to the department of the engineers were first embodied at the termination of the war between Great Britain and her American colonies, and they then received the designation of Royal Military Artificers. In 1811 it was proposed to select some companies from the corps of Royal Military Artificers, and to form them into a body expressly for the purpose of executing field-works; and in the following year this proposal was carried into effect. The name of the whole corps was then changed into that of Royal Sappers and Miners; and Lord Mulgrave formed at Chatham the institution at which the men have ever since been regularly instructed in all the duties connected with military engineering. This institution was long under the direction of Colonel, now Major-General Pasley, and, since his retirement, it has been commanded by Colonel Sir Frederick Smith. Besides the regular course of instruction in sapping, mining, making gabions, fascines, &c., the men are taught the most elementary principles of fortification, the manner of drawing plans and sections of buildings, and, to a certain extent, the art of land-surveying. It ought to be mentioned that the troops of the corps have invariably, in whatever part of the world they have been employed, conducted themselves as intelligent men and steady soldiers.

SAPPHIRE. [Corundum.]

SAPPHO was a native of the island of Lesbos. The time of her birth is unknown, and there are few events of her life which can be exactly ascertained. Her own fragments, as well as those of Alcæus, show that these two greatest poets of the Æolic school were contemporaries. Sappho appears to have been alive in B.C. 568, as appears from Herodotus (ii. 135), and Athenæus (xiii. p. 596). The story of her leap from the Leucadian rock is a mere fiction. We know in fact nothing of Sappho except from the fragments of her own poems, and some of Alcæus.

With the exception of one complete ode, another perhaps nearly complete, and many short fragments, the poems of Sappho have perished; but what we possess is sufficient to justify the admiration of the ancients. In warmth and purity of feeling, in grace and sweetness, and in delicacy and beauty of expression, she has perhaps never been excelled by any lyric poet either of ancient or modern times. The ancients divided her poems into nine books, which consisted of erotic odes, epithalamia, hymns to the gods, and other poems. The rhythmical construction of her odes was the same as that of Alcæus. There is a verse called the Sapphic verse, which derives its name from the Greek poetess. The verse is as follows:—



The Sapphic strophe consists of three Sapphic verses followed by a versus Adonicus, consisting of a dactyle and a spondee. It was imitated by

Horace and Catullus, and has been used in some modern languages.

The best separate editions are by H. F. M. Volger, Leipzig, 1810, 8vo.; and by C. F. Neue, Berlin, 1827, 4to.

SAPY'GIDÆ, a family of Hymenopterous Insects of the section *Fossores*, the species of which are chiefly distinguished by the feet, in both sexes, being slender, and little or not at all spinose; the antennæ are at least as long as the head and thorax together, and generally increase in thickness towards the extremity.

The following genera may be enumerated: *Sapyga*, *Thynnus*, and *Polochrum*. (Cuv. 'Règne Animal,' vol. v., p. 319.)

SARACENS, a name improperly given by the Christian authors of the middle ages to the Mohammedans who invaded France and settled in Sicily. The true derivation of the name is *sharkeyn*, which means in Arabic 'the eastern people'—first corrupted into Saraceni (Σαρακηνοί) by the Greek writers, and thence into *Saraceni* by the Latin writers. The name Saraceni occurs in Pliny (vi. 28), and it seems that it began to be used about the first century of our æra, and was applied to the Bedouin Arabs who inhabited the countries between the Euphrates and the Tigris. In course of time it became the generic name of all the Arabian tribes who embraced the religion of Mohammed, and spread their conquests over the greater portion of Asia and Africa. [MOORS.]

SARAGOSSA, properly *Zaragoza*, the ancient *Cæsarea Augusta*, the capital of Aragon in Spain, is situated in 41° 47′ N. lat., 0° 43′ W. long., in a fertile plain near the canal of Aragon, and on the left bank of the Ebro, which is crossed by a fine stone bridge of 7 arches. The Gallego and the Huerva enter the Ebro on opposite banks near the town. Zaragoza is 175 miles N.E. from Madrid, and has about 65,000 inhabitants. Most of the streets are narrow and crooked; the houses are old, but regularly and substantially built. The city has many remarkable buildings. The Exchange is a fine stone edifice, round which marble busts of most of the kings of Aragon are placed in niches. Nearly opposite to the exchange is La Casa de la Diputacion, a noble building erected by Alfonso V., in the principal hall of which are portraits of the kings of Aragon. It serves for the sittings of the Audiencia, or supreme court of justice. The palace of Aljaferia, formerly the residence of the kings of Aragon, is a fine square building with towers at the angles. The orphan asylum, built by Ferdinand V., the last king of Aragon, is much admired for its solidity and beautiful proportions. The metropolitan church, called La Seu, is distinguished by its elaborate front and high tower. The cathedral of Nuestra-Señora-del-Pilar is likewise a superb building. The principal altar, built entirely of alabaster, in the gothic style, is greatly admired as a piece of ancient sculpture. In the middle of the church is a statue of the Virgin on a marble pillar. Many of the monasteries are deserving of attention; but several of them were injured or destroyed during the two sieges of the city by the French. Another singular edifice in Zaragoza is the leaning tower, which has remained in its present inclined position since 1594, the year in which it was built. Zaragoza has eight gates, besides the four old ones in the wall of Augustus, part of which may still be traced. There is a university, founded in the year 1474. Zaragoza gives title to an archbishop, and is the residence of the Captain-General of Aragon.

Zaragoza was called Salduba. (Plinius, lib. iii., c. 3.) Augustus having colonised it gave it the name of Cæsaraugusta, of which Zaragoza is a corruption. It was taken by the Goths in 470; and by the Moors in 712, under whom it became the capital of an independent state about the beginning of the 11th century. In 1118, Alfonso I. of Aragon recovered the city from the Moors after a siege of eight months; and the defeat of the Moors at Albacete in 1145 restored the whole of Aragon to the Christians. From that year till the accession of Charles V. Zaragoza was the capital of the kingdom of Aragon, as it has since been of the province of Aragon. Zaragoza is famous for two sieges which it sustained during the Peninsular war, in May, 1808, and in November, 1808. During the former the French made themselves masters of nearly half the city, but every inch they gained had been obstinately defended by the citizens commanded by the gallant Palafox. The struggle continued for eleven days, almost without intermission, until the French general, convinced that he could no longer hold his position within the city, raised the siege, with the loss of several thousand men. The second French attack on the city was attended with better success; though the obstinate bravery of the townsfolk who defended street by street, house by house, and room by room, caused great loss of life. It was in this siege that a young girl, since styled the Maid of Saragossa, distinguished herself by her steady courage and intrepidity. At last an epidemic fever, which broke out among the besieged, compelled them to surrender in January, 1809. The injuries sustained by the city during these sieges remain unrepaired. On the 2nd of March, 1838, Cabañero, one of Don Carlos's generals, succeeded in penetrating at night into the city, and taking possession of the principal posts. The people, without chiefs, and badly armed, fell upon the assailants, made 2000 prisoners, and expelled the remainder from their walls.

SARATOW, a government of Asiatic Russia, lies between 48° and 53° N. lat., and 42° 20′ and 50° 20′ E. long. It is bounded on the N. by Pensa, Simbirsk, and Orenburg, on the E. and S. by Astrakhan, and on the W. by Tambow, Voronesh, and the country of the Don Cossacks. The soil of this government is very unequal: the eastern portion being an extensive sterile steppe, while the western is undulating and fertile. The Volga traverses the government in its whole length from N. to S. It receives some small streams, both on the E. and W. To the west of the Volga there are some tributaries of the Don, which run from S. to N. In the eastern part there are many lakes, the most remarkable of which is the salt-lake of Elton, which is 11

miles long by 9 miles broad; it yields annually about 100,000 tons of pure salt, in collecting which 10,000 workmen are employed. There are some other less considerable salt lakes. The climate is temperate, the air dry and healthy. The steppe serves only for pasturage; but the western district yields much corn. Rye, wheat, oats, peas, millet, flax, hemp, tobacco, hops, madder, and many kinds of fruit, are cultivated. The forests, which are chiefly to the N.W., consist of oaks, pines, maples, and poplars. The breeding of cattle is, next to agriculture, the chief occupation of the inhabitants. The Tartars keep a great quantity of bees. Game is still abundant in the N.W. parts. The fisheries on the Volga not only supply the home consumption, but furnish a large surplus for exportation. The minerals are salt, millstones, and a little iron.

The population of this government, which amounts to 1,718,600, is composed of Russians, Tartars, Cossacks, and other tribes, besides a great number of foreign colonists. Catherine II. introduced a colony of 10,000 foreigners into Saratow; they consisted of Swiss, Germans, French, and Swedes, who were received at first in 16 large barracks near the town, and afterwards houses were built for them on the land assigned to them; the Empress presented them with the utensils, flocks, draught-cattle, and seed-corn, and provisions for their subsistence for a considerable time; she also exempted them for ten years from all taxes. Thus they soon prospered, and gradually founded 104 villages, most of which are on the right bank of the Volga. Most of these colonies have Protestant churches; in the rest the people generally profess the Roman Catholic religion. The little town of Sarepta was founded by the Moravian brethren, who are still its only inhabitants.

Saratow, the capital, is situated on the right bank of the Volga, in 51° 31′ N. lat., 46° E. long., in an arid and barren valley, between the river and a range of pretty high calcareous mountains. The town, which is neither handsome nor regular, is divided into the upper and lower towns. It was built on its present site in 1665, and has been frequently damaged by fire. The greater part of the city is built of wood. There are 7 stone and several wooden churches, 2 convents, and a very large market-place or bazaar. There is likewise a gymnasium and a botanic garden. Saratow has an extensive trade. The population is stated to be upwards of 40,000. *Volgsk*, with 8,500 inhabitants, is a very pretty town, built at the foot of a high mountain on the right bank of the Volga, about 90 miles above Saratow: it is inhabited by wealthy merchants, who carry on a considerable trade. The neat town of *Sarepta* was founded in 1765. All the streets, which are planted with poplars, terminate in a very large market-place, with a fountain in the centre, which supplies every house with water. Among the public buildings there are three deserving of notice: the Asylum of the Sisters, in which all the unmarried women reside; the Asylum of the Brethren, for all the unmarried young men; and the Asylum for Widows. The gardens round the town are cultivated with extreme care. The Moravians carry on many manufactures, and trade with the Calmucks.

SARAWAK. [Borneo.]

SARCOCELE (from *σάρξ*, flesh, and *κήλη*, a tumor) is the name of a disease by which the testicle becomes altered from its natural structure, and converted into a hard flesh-like substance.

SARCOÏDEA, a group of *Polypiaria*, of which the type is the old Linnæan genus *Alcyonium*.

Lamouroux employs the title Polypiaria Sarcoïdea for one of his three great divisions of Polypiaria (1821). The arrangement stands thus:—

Div. 1. Supports flexible or not entirely stony.
2. Supports entirely stony.
3. Supports fleshy, more or less irritable, and without central axis.

This division includes three orders, viz.:—

Alcyoniæ, in which are eight genera, viz., Alcyonium, Lobularia, Ammothea, Xenia, Anthelia, Alcyonidia, Alcyonella, Hallirrhoë.

Polycliniæ (belonging to Tunicata).

Actinariæ, in which are seven genera, viz. Chenendopora, Hypalimus, Lymnoria, Pelagia, Montlivaltia, Isaura, Ierea. (These are fossil groups.)

This system is mainly based on the previous labours of Lamarck (1816), who placed Alcyonium in his group of *Polypiers Empatés*, but included, after Savigny (to whom we owe most of our knowledge of these animals), in his group of *Polypiers Tubifères* the genera Anthelia, Xenia, Ammothea, Lobularia.

SARCO′MA is a morbid tumour whose tissue is fleshy and moderately firm. Several species of sarcoma were described by Mr. Abernethy in his 'Classification of Tumours,' such as the common vascular sarcoma, the adipose or fatty kind, the pancreatic, the mammary, &c. Some of these still retain the same names, but in general the term Sarcoma has no other meaning in surgical works than the indefinite one already given, and includes all fleshy tumours that are not cancerous, or medullary, or melanotic.

SARCO′PHAGUS (from a Greek word, *σαρκοφάγος*, which literally signifies *flesh-eater*) is the name given to the Egyptian stone coffins. It is not known when this strange term was first applied to them, nor why. These coffins consist of two parts, a case formed of one piece, and open at the top, in which the mummy was to be deposited, and a lid to cover the top. As these sarcophagi are generally of hard stone, and often extremely hard, the working of them must have been very expensive, and they could only have been made for kings and very rich persons. There are some fine specimens in the British Museum.

SARDANAPA′LUS is the name by which the Greek and Roman writers designate the last king of Assyria. He was a man of voluptuous habits, who spent his life in his palace at Ninus or Niniveh, surrounded by women. The common account of the mode in which he ended his life is given by Diodórus Siculus (ii. 24–27) and Justin (i. 3). Arbaces, who was his satrap in Media, despising the unmanly occupations of his master,

formed a conspiracy against him, and marched with a force against Niniveh. After some success against the rebels, Sardanapalus was defeated, and shut himself up in his capital, where he maintained himself for two years. At last when he saw that further resistance was useless, he caused a pyre to be raised, on which he burnt himself with all his treasures and his women. Assyria thus fell into the hands of the Medes, who united it with Media. The time of this event is uncertain; some suppose that it took place about 880, some again place it in the year 717, and others in 606 B.C.

SARDEGNA, SARDINIA, a large island in the Mediterranean, situated between 38° 52′ and 41° 17′ N. lat., and between 8° 4′ and 9° 50′ E. long. Its form is nearly a parallelogram, 140 miles in length, with an average breadth of 60 miles. The area is 9,224 square miles. The population in 1839 was 524,633. The eastern shore of Sardinia faces the coasts of Rome and Naples. The shortest distance from Sardinia to Italy is 150 miles, to Sicily 170 miles, to Africa 120 miles, and to France 180 miles. The island contains excellent harbours; S. Pietro and Porto Conte on the western coast, the roadsteads of Maddalena on the northern coast, and Terravona on the eastern, besides the spacious bays of Cagliari, Palmas, Oristano, and Alghero, and the roadsteads of Vignola, Tortoli, and Porto Torres.

A chain of primitive mountains runs from N. to S. along the whole eastern side of the island, occupying about one-third of its surface, and forming the wild districts of Gallura, Ogliastra, Barbargia, Sarabus, and Budui: this range consists of granite and schistus, with large masses of quartz, mica, and felspar. The highest peak of this range is Ginargentu, 5276 feet. West of this highland region, and extending along the centre of the island, there is a succession of fine plains intersected by ranges of smaller hills, and stretching in some places as far as the western coast, as for instance at Oristano and Alghero. The rest of the western coast is occupied by several unconnected mountain groups. At the south-western extremity are the mountains of Sulcis, north of which are those of Murgiani and Arcuentu, which rise along the western coast, and the latter of which attains the height of 2315 feet. Another mountain range divides the north-west part of the island from the remainder. At the north-west extremity is the mountainous peninsula of Nurra, which stretches out into the sea, terminating in three abrupt headlands, Cape Caccia to the south, above 500 feet high, Cape Argentaro to the west, and Cape Falcon to the north. Opposite this peninsula lies the small mountainous island of Asinara.

A volcanic district extends along the centre of the island nearly from north to south. The town wall and most of the houses of Castel Sardo are built of lava. The river Coguinas forms on this side the geological boundary between the primitive formations of the eastern country, and the trap and volcanic products to the westward. There are indications of volcanic action near Nurri, near Alies, and near Monastir.

The principal rivers of Sardinia are the Tirsi, the Coguinas, the Flumendoso, and the Manna. The Tirsi, the Thyrsus of Ptolemæus, flows into the sea on the south coast, after a course of 70 or 80 miles. The Coguinas enters the sea a few miles east of Castel Sardo, after a course of about 60 miles. The Flumendoso enters the sea between two low rocky points, on which stand the towers of Xalinas and Corallo, after a course of between 50 and 60 miles. The Mannu enters the lake of Cagliari, which lies west of the city of Cagliari. This lake is six or seven miles long by three or four broad, and communicates with the sea by seven cuts through a narrow strip of sand. This lake is navigated by flat-bottomed boats, and contains abundance of fish. These four rivers have many tributaries, and there are other minor streams.

The climate of Sardinia varies greatly according to the seasons and localities. The extremes of heat and cold are considerable. The north-west wind is the healthiest, and the east or south-east the most noxious. Hail and thunder-storms are rare, but rain falls copiously in the autumn. In the summer the country is subject to long droughts, but the heavy dews of the night partly compensate for the want of rain. Earthquakes are very rare and slight. The plains and some of the lower valleys of Sardinia have been notoriously unhealthy ever since the time of the Romans. Cicero, Strabo, Martial, and in later times Dante, all speak in strong terms of the insalubrity of Sardinia. The malaria of Sardinia, called by the natives ‘intemperie,’ is peculiar in its effects, and requires great precautions on the part of those exposed to it. The migrations caused by the intemperie, the scarcity of cottages, pastures, and enclosures, and the numerous tracts of uncultivated land, give to the plains of Sardinia an aspect of depopulation, especially in summer.

The lands of Sardinia are divided into feudal and non-feudal. The feudal lands either belong to the respective nobles, or have been sold to private individuals, who still recognise the feudal lord by paying him a trifling fee, and are under some restrictions. The lands not feudal belong either to communities or individuals, and can be let or sold, or given away at the will of the owners. One-third of the surface of the island consists of waste land, of sandy or stony districts, and lakes and marshes; another third is occupied by forests or natural pastures; and the remainder consists of corn-fields, vineyards, olive-grounds, orchards, and gardens.

Sardinia is well provided with forests; the best timber is in the mountainous districts. The cork-tree grows very large and in great quantity in the northern part of the island. Timber is very scarce in the plains, and the want of roads prevents the people from making use of that of the mountain forests. Dwarf mulberry-trees grow in abundance, but their cultivation is little attended to. Among fruit-trees, the fig, the vine, the apple, apricot, peach, almond, and prickly pear, are the most common. Vegetables are fine and plentiful. Saffron is cultivated, and is much used in cookery. The vine is extensively cultivated, both soil and climate being highly favourable to it; and though the process of making wine is still very imperfect,

Sardinia produces some excellent wines. Malvasia, or Malmsey, and Muscat are both Sardinian wines. There are several extensive olive-grounds, but the oil has not yet been largely exported, although this branch of commerce is on the increase. Cheese is a great object of rural economy; it is made chiefly from sheep and goats' milk, and being steeped in brine it has a salt bitter taste. Little butter is made, as the treatment of cows is not well understood, and fodder is scarce. Tobacco is grown in some districts, and is a royal monopoly.

Salt is a monopoly of the government, and a profitable branch of the royal revenue. The salterns are round the gulf of Cagliari, at Oristano, Terranova, and on the northern coast west of Porto Torres. The salterns are worked by convicts sentenced to the galleys, but the excavation of the mounds and the carriage of the salt is a labour forced on the adjacent villagers, for which they receive a small compensation.

Flax is cultivated to a small extent, and is woven into linen. Wool is coarse, owing to the flocks being neglected, and it is manufactured into coarse cloth for the peasantry. A better quality of cloth and fine flannel are made of lambs' wool. The forests abound with stags, small deer, wild boars, and mufloni, or murvoni, a species of large sheep, clothed with hair instead of wool.

The fisheries of Sardinia are very productive, especially the establishments for taking the tunny-fish, which are on various parts of the coast. The fishery lasts from April to July. Most of the tunnies weigh from 100 to 300 lbs.; and all the parts of the fish are turned to account, and most of them are salted. Most of the tunneries are let to foreigners, who ship off the produce to various ports of the Mediterranean, and a comparatively small proportion is used in the island. There are fisheries of anchovies, sardines, coral, and pearls off the coast. The coral is polished and worked into necklaces, earrings, and other ornaments, at Genoa, Leghorn, Marseille, and Naples. The pearls are of inferior quality.

Sardinia was noted in ancient times for its mines, which were worked to a great extent, as is attested by vast excavations and remains of foundries. Gold and silver mines were at one time worked. Mercury, iron, and lead are met with in various parts. In the eastern mountains are found porphyry, basalt, alabaster, and marble. Chalcedonies, jaspers, carnelians, sardonyx, turquoises, and rock crystal, are found in the mountains of the west.

The island was divided for administrative purposes into 11 prefetture, or small provinces; but in Oct., 1848, a new administrative division was made into three districts, of which Cagliari, Sassari, and Nuovo are the chief seats. For ecclesiastical purposes Sardinia is divided into 11 dioceses. There are 3 archbishops, 3 mitred abbots, about 90 convents of monks, and 10 or 12 of nuns. The Roman Catholic is the only religion of the country; no other is tolerated.

Sardinia is administered by a viceroy, appointed by the king for three years. Every viceroy, on his arrival at Cagliari, takes a solemn oath to preserve inviolate the statutes and privileges of the island. Sardinia has a representative parliament, called Stamenti, consisting of the three orders, or estates, the ecclesiastical stamento, the military stamento, and the royal stamento, the last being composed of the representatives of the towns. Each stamento holds its sittings apart, in a separate hall, and after separately discussing the matter in debate, they communicate by deputies. The assembly of the stamenti is convened and holden by and during the king's pleasure.

The feudal system continues in activity, though considerably limited by the interference of the crown. Vassals are born free, and can change their lord and residence at will, but while on a lord's estate they are bound to feudal services and tenures.

The Sards were of old a very mixed race, partly of Celtic and Iberian stock, and partly of Greek and Etruscan race, to which a considerable infusion of Carthaginian and afterwards of Roman blood was added. In later times Pisans and Spaniards settled in the towns and lower country. In the highlands the population has remained comparatively unmixed, and may be considered as the real descendants of the old Sards, who struggled hard against both Carthage and Rome. The Sards are of middle stature, and well formed, with dark eyes and coarse black hair.

Italian is the language of the government, and is also spoken by all educated persons in the large towns. The native tongue, which varies according to districts, is a dialect of the old Romance, and is evidently derived from the Latin, with an admixture of words of Greek and Arabic origin. At Alghero the Catalonian is generally spoken, the inhabitants being in great measure the descendants of a Catalonian colony, established by Peter the Ceremonious, king of Aragon, in 1355.

The nobles and citizens generally follow the fashions of Italy in their dress, but the country people have peculiar costumes. In the Campidano they wear a jacket or pelisse of undressed sheep or goat skins, with the fleece outside. In the west, near Bosa, and in the Sulcis, they wear a close sleeveless waistcoat of tanned leather, folding on the breast and reaching nearly to the knee. The dress of the females in the towns is an imitation of the Italian fashion. The peasantry adhere to their peculiar costumes.

The villages are generally large and well situated, but with unpaved narrow streets, mean houses, and a general want of comfort. The villages in the Gallura are built of granite blocks, and in the other northern districts of freestone; but in the southern division of the island most houses in the country are built of sun-dried bricks. The dwellings of the peasants have generally only one story, without windows. In the towns there are some tolerable mansions, though comfortless inside, like those of South Italy, and the access is generally dirty.

By a royal decree of 1822 a high road of 125 miles in length was ordered to be cut from Cagliari to Sassari through the length of the island. It has since been completed, and there are branch roads from it to the most important towns in the interior.

Field sports, such as hunting the boar, stag, or

mouflon, as well as sporting for birds, are favourite amusements with the Sards. Their religious festivities and processions, to which they are much attached, afford them also periodical seasons for rejoicing: they are attended with great pomp, and generally end in a feast. Many of the manners and customs resemble those of the modern Greeks.

Besides the regular force, to which Sardinia contributes one regiment, and the militia, there is a kind of yeomanry called Barancelli, an armed association for protecting property, especially in the lowlands, against robbers. Every village has its party, under a captain annually selected from among the most respectable inhabitants; and he chooses his men. They maintain a strict watch during the night, from a certain hour in the evening, which varies according to the season, and is made known to the inhabitants by the sound of a bell, after which no one is allowed to be out of doors till the tolling of the morning bell.

The only three regularly-fortified towns are Cagliari, Alghero, and Castel Sardo. The coasts are defended by a line of stout towers, garrisoned by a body of coast-guards called Torrari.

Scientific education is given by the two universities of Cagliari and Sassari, each of which has a library and a cabinet of natural history.

The principal towns of Sardinia are the following, with the population of each in 1845:—Cagliari, the capital and the residence of the viceroy. Population, 30,063. *Sassari*, the head town of the north part of the island, situated on a gentle declivity, in a pleasant and fertile country, has a good main street, fine public walks, 24 churches, 10 convents, 3 nunneries, a clerical seminary, the university, a college kept by the Jesuits, several palaces, a public hospital, and some good shops of various kinds, among others a bookseller's shop, a rarity in Sardinia. The cathedral is a large structure, with a very elaborate façade. The town has no springs or wells, but good water is brought to the houses by water-carriers, from a handsome fountain outside of the walls. Population, 22,883. Alghero. Population, 8716. *Oristano*, a town in a low unhealthy plain, near the mouth of the Tirsi, has several churches and convents, a clerical seminary, a college, and a spacious cathedral, with a detached octangular belfry. Population, 6041. *Bosa* is finely situated in a fruitful valley on the north bank of the river Termo, a short distance from the sea. Bosa has nine churches, some convents, a clerical seminary, several paved streets, and a long bridge over the river. Population, 6260. *Iglesias*, a pleasant town on an elevated and fertile plain, is abundantly supplied with good water, conducted by an aqueduct, 8000 feet in length, to a fountain in the centre of the town. The streets are dirty and ill paved, but they contain some good houses. The cathedral and bishop's palace are remarkable structures. The town is surrounded by a dilapidated Pisan wall, and the remains of a castle are seen on a hill to the north. Population, 5040. *Tempio*, the head town of the mountainous province of Gallura, in the north-eastern highlands, stands in a very healthy situation; it has several large houses three stories high, built of granite, with wooden balconies, a collegiate church, a nunnery, a college, and about 5000 inhabitants. The general appearance of the town is gloomy. *Ozieri*, 27 miles E.S.E. from Sassari, occupies the sides of several hills and the bottom of a narrow valley. Population, 7200. *Quartu*, east of Cagliari, near the sea-coast, has about 4000 inhabitants, and carries on considerable trade in wine, fruit, and fisheries. *Villacidro*, at the foot of the mountains N.W. of Cagliari, in a healthy situation, has about 5000 inhabitants. *Osilo*, on a mountain 2000 feet above the sea, E. of Sassari, has 5400 inhabitants. *Sorso*, in the same district, has 4000 inhabitants. *Bonorva* has 4000 inhabitants. There are many large villages, of between 2000 and 3000 inhabitants, scattered all over the island.

History.—Iolâus is said to have led a Greek colony into Sardinia, and to have founded Olbia on the north-east coast, afterwards a considerable town in the Roman period, and of which vestiges are found in Terranova. The island became well known to the Greeks. Nura, afterwards one of the chief towns of the island, is particularly noticed in the Roman period, of which there are many remains.

The first Carthaginian expedition to Sardinia, of which the epoch however is not ascertained, was led by Machæus, or Malchus, or Melech. About 490 B.C. Hasdrubal and Hamilcar, sons of Mago, led another expedition to Sardinia, which gained a footing in the southern part of the island, and built or colonised Cáralis and Sulcis. The lower parts of the island were permanently in possession of the Carthaginians until the first Punic war. Sulcis was one of their chief colonies. During the first Punic war the Romans attacked and defeated the Carthaginian fleet at Olbia, where Hanno, the commander, fell; and again they gained another naval victory over the Carthaginians at Caralis, but they do not seem to have got a permanent footing on the island, which at the conclusion of the war still belonged to Carthage. A disagreement between the Carthaginians and the Sards led however to a conquest of the greater part of the island by the Romans, who incorporated it, with Corsica, into a Roman province, under a prætor, about B.C. 228. After the breaking out of the second Punic war, the Sards, weary of their Roman masters, applied to Carthage for assistance; but the Romans defeated the united Sards and Carthaginians. About 178 B.C. Sardinia, being in a state of open insurrection, was made a consular province; and an army sent for the purpose completely defeated the insurgents. All the people of Sardinia returned to the allegiance of Rome, and a double tribute was imposed upon them. The number of prisoners brought to Rome, and there sold in the market as slaves, give rise to the proverb, 'Sardi venales,' which, from its double meaning, was afterwards construed into a term of reproach. It was stated that 80,000 Sards had either fallen or been made prisoners. Caius Gracchus was afterwards employed to suppress another insurrection.

During the great civil wars Sardinia shared the calamities of the rest of the Roman provinces, following alternately the fortunes of Marius or

Sulla, of Cæsar or Pompeius. The island remained quiet during the period of the Empire, being considered by the Romans as one of their granaries and a penal colony for their criminals. Sardinia was conquered by Genseric, king of the Vandals. After the overthrow of the Vandal kingdom by Belisarius, Sardinia was annexed to the prefectship of Africa, and was governed by an officer styled Duke.

The Saracens began, about the year 720, to ravage the coasts of Sardinia; and as the Byzantine emperors were unable to protect their distant dependencies, the natives applied for assistance first to the Longobards, and afterwards to Louis le Debonnaire, Charlemagne's son, to whom they tendered their allegiance.

About the year 1000 Musait, a Moorish chieftain, sailed from Africa to Cagliari with a large force, took it, and conquered the greater part of the island, and assumed the title of king of Sardinia. He was expelled by the Pisans and Genoese (1016–1022), whereupon the Genoese kept for themselves Corsica and Capraja, and the Pisans had Sardinia. The Pisans divided it into four provinces, called Giudicature, and appointed Pisan noblemen over each, styled 'Giudice,' each independent of the others, but all feudatory to Pisa. Genoa had a small district on the north coast; but being dissatisfied with this portion numerous intrigues and contests ensued between the Pisans and Genoese. The Emperor Frederic II. took advantage of these disputes to make his natural son Hentzius king of Sardinia. The subsequent disputes between Frederic II. and the Pope made Hentzius and the Pisans, who were Ghibelines, join together against the Pope and the Genoese. His title of king of Sardinia was however a mere name, and the various judges of the island ruled as independent princes, whilst Pisa and Genoa continued to fight for their respective claims to the nominal sovereignty.

In 1297 Pope Boniface VIII. gave James of Aragon the investiture of the kingdom of Sardinia as a fief of the see of Rome. Although the Sicilians themselves did not consent to the exchange, and proclaimed Frederic, James's brother, as their king, the investiture of Sardinia was confirmed to James by Pope Clement V., in 1309. After various ineffectual struggles on the part of the Pisans, Sardinia was given up by the republic to the crown of Aragon in 1325. For some years after this the Sards and the Genoese combined to resist the Aragonese; but the king, in 1355, with the view of terminating the system of intestine warfare, convoked a general parliament, after the model of the Cortes of Spain, consisting of prelates, peers, and commons, which was called Stamenti, or Estates. He thus laid the foundation of a representative government in Sardinia, which, though on a contracted basis, has been the means of saving the island from military despotism, and still subsists at the present day. In 1428 the whole island became subject to the crown of Aragon. In 1492 Ferdinand the Catholic established the Inquisition in Sardinia, and ordered the expulsion of all Jews who refused to be baptized, and their synagogues to be converted into churches. From that time the Jews have not been tolerated in Sardinia.

By the union of the crowns of Aragon and Castile, Sardinia became an appendage of the Spanish monarchy, and was ruled for two centuries by triennial viceroys sent from Spain, under whose administration the country sunk into decay, like Sicily, Naples, and the rest of the Spanish dependencies. In the war of the Spanish succession Sardinia was the subject of many conflicting claims; but in 1720 it was given to Victor Amadeus, duke of Savoy, who then assumed the kingly title. From that time the history of Sardinia becomes closely connected with that of the house of Savoy. [Sardinian States.]

SARDE'S or SARDIS, the ancient capital of Lydia, now *Sart*, is situated in the valley of the Hermus, and on the Pactólus, one of the tributaries of that river. The most remarkable feature at Sardes is the Acrópolis, one side of which is so steep, that in the time of Crœsus, when the rest of the Acropolis was fortified, this part was considered secure against an enemy. It was on this side however that the place was taken by the Persians under Cyrus. (Herod., i. 84.) The Acropolis is continually crumbling, and it presents a very rugged and fantastic outline. There are the remains of a large and magnificent temple, the western front of which is on the Pactolus, and the eastern under the steep rock of the Acropolis. There are also traces of a theatre and of a stadium under the north side of the Acropolis. Sart is now a miserable place, consisting of a few mud huts. Sardes is one of the seven churches of Asia mentioned in the Book of Revelation.

SARDINIA. [Sardegna.]

SARDINIAN STATES (STATI SARDI) is the name of the dominions of the house of Savoy, which constitute a monarchy, the head of which derives his title of king from the island or kingdom of Sardinia. These states consist of—1, the duchy of Savoy; 2, the principality of Piedmont, in its larger sense; 3, the duchy of Genoa; 4, the county of Nizza; 5, the island of Sardegna, which forms a separate state, and has its own distinct administration. The Continental Territories, 'Stati di Terra Ferma,' which had in 1839 a population of 4,125,735, have now one uniform system, administrative and judicial, being divided into 40 provinces. For military purposes the territories are divided into 8 sections.

Each province is administered by a political officer called Intendente, appointed by the king. The province being an aggregate of communes, each commune has a Sindaco, or mayor, who is subordinate to the Intendente. For judicial purposes, each province has a collegiate court, called Tribunale di Prefettura, which sits in the chief town. There is no jury in the Sardinian states. The provinces are divided into districts called Giudicature, in each of which there is a judge called Giudice di Mandamento, answering to the French Juge de Paix, with a secretary. There are more than 410 of these giudicature. There are four supreme courts, which are also courts of appeal from the Tribunali di Prefettura, and which are called Senati. A court styled Regia Camera

dei Conti decides in all fiscal and feudal suits. There is an admiralty court, which sits at Genoa. Commercial courts are established at several places. Ecclesiastical courts, Curie Vescovili, exist in every diocese.

The old Continental Territories of the house of Savoy were administered till lately by the Reali Costituzioni, a compilation of numerous edicts and decisions of the dukes of Savoy, which was published in 1770, and is mainly based on the Roman and canon laws. A new code, entitled Codice Albertino, was promulgated by the late king Carlo Alberto.

The established religion is Roman Catholic. The ecclesiastical administration is under the 4 archbishops of Turin, Chambéry, Genoa, and Vercelli, and 26 bishops. The number of collegiate churches, besides cathedrals, is about 70, and that of clerical seminaries about 50. There are in all the Continental States about 240 convents of monks, and about 80 convents of nuns.

The Continental States of the king of Sardinia have several fine carriage-roads across the Alps and Apennines, which intersect their Territory. The plains of Piedmont are well supplied with canals, chiefly for the purpose of irrigation. The staple products of the Continental Sardinian Territories for exportation are silk, rice, hemp, wine, and oil. The principal manufactures consist of paper, silks, woollens, linen, glass, and cotton yarn. The importation of colonial articles and English manufactures takes place chiefly through the port of Genoa. A considerable trade is carried on with Switzerland and Germany by the Lago Maggiore and the road of Mount St. Bernard leading to the Grisons.

The commerce of the three principal ports of the Sardinian States, Nice, Genoa, and Cagliari, is illustrated by the following statement for 1846 :—

Ships which entered and declared at

	Vessels.	Tons.	Crews.
Genoa	4692	576,705	39,743
Nice	5192	309,399	32,270
Cagliari . . .	724	79,918	6,711
	10,608	966,022	78,724

History.—The history of the country is identical with that of the house of Savoy. The origin of this house is involved in the greatest obscurity; but the first historical ancestor of the house is Humbert, Count of Maurienne and great vassal of Rudolf III. of Burgundy. The Emperor Conrad, about 1040, gave Humbert military jurisdiction over Maurienne and other parts of Savoy, the lower Valais, and also the valley of Aosta. Humbert's son Otho extended the dominions of the house of Savoy to the banks of the Po, by a marriage with Adelaide of Susa, daughter of the Marquess of the Marches, or frontier district of north Italy. Otho died about the year 1060; and Adelaide ruled after his death as regent for their sons. The two sons, Peter and Amadeus II., became successively counts of Savoy.

Humbert III., son of Amadeus II., became count in 1091; but he lost some of the patrimonial estates by various intrigues. The great towns, Turin, Asti, Chieri, and others, availed themselves

of the general confusion occasioned by the long struggle between the Pope and the Emperor to assert their independence of all vassalage except the nominal one to the Empire. Humbert died in Savoy in 1103, and was succeeded by his son Amadeus III., who received from Henry V. of Germany the investiture of all Savoy as an Imperial county. Amadeus recovered many possessions lost by his father. He died in 1148, and was succeeded by his son, Humbert III. During the long wars of the Emperor Frederick I. against the Italian communes, Humbert, as great vassal of the empire, at first followed the banners of his sovereign, but afterwards kept aloof from him, and the consequence was that Frederic deprived him of part of his dominions, among the rest of Turin, creating the bishop of that city a prince of the empire. Thomas I. (1188–1233) obtained favour with the Emperor, and recovered many territories, but could not regain Turin or Asti. Amadeus IV. (1233–1253) regained Turin. Boniface (1253–1263) laid siege to Turin, which had revolted, but was defeated, and died in prison at Turin. Peter (1263–1268) was brother-in-law to Henry III. of England, who had married Peter's sister. He repaired to England in 1241, and was received with great honours by Henry and his consort. Henry made him Earl of Richmond, and gave him for his residence a palace near London on the banks of the Thames, which was from that circumstance called Savoy House. Peter had a great reputation for wisdom and chivalric gallantry; he obtained possession of the fine district now known as the Canton de Vaud, in Switzerland, and in other ways increased the power of his family. Philip I. (1268–1284) had a comparatively quiet reign. Amadeus V. (1284–1323) had many contests with neighbouring princes concerning territorial rights, in which his success earned for him the title of the Great.

Edward (1323–1329) had to repel the repeated attacks of the Dauphin of Vienne, the Count of Geneva, and the Baron of Faucigny, who were leagued against him. At last, through the mediation of Philip of Valois, king of France, peace was made. The Count of Savoy, in 1328, led a body of men to join King Philip against the Flemish, and contributed to the defeat of the latter by the French at Mount Cassel. Aymon, Edward's brother (1329–1343), was proclaimed his successor by the states of Savoy, in preference to Edward's daughter, who was married to the Duke of Brittany. The states declared on that occasion that so long as there were any male descendants or collaterals in the house of Savoy, no female, however near in the direct line, should reign. Aymon's reign was peaceful and advantageous to his subjects.

Amadeus VI. (1343–1383), Amadeus VII. (1383–1391), and Amadeus VIII. (1391–1440), were all popular and successful princes. [Amadeus VI.; Amadeus VII.; Amadeus VIII.] Under Amadeus VIII. the whole of Savoy was finally united under one sovereign; he bore the titles of Duke of Savoy, Chablais, and Aosta, Prince of Piedmont, Count of Genevois, Bugey, and Nice, Baron of Vaud and Faucigny, and Mar-

quis of Italy; and from his time the house of Savoy assumed a distinguished place among the sovereign houses of Europe.

Ludovic (1440–1465) married into the royal family of Cyprus; and the title of king of Cyprus and Jerusalem is still assumed by the representative of the dynasty of Savoy. Ludovic created a supreme court of justice for Piedmont, called a Senate; and he admitted the barons of Piedmont to the first offices of the state, which had been till then monopolised by the Savoyards. Amadeus IX. (1465–1472) was a sickly prince, unequal to the duties of his office. Philibert (1472–1482) was a minor till a few months before his death. Charles I. (1482–1489), Charles II. (1489–1496), and Philip II. (1496–1497), had short reigns, not marked by any important events. Philibert II. (1497–1504) and Charles III. (1504–1553) were involved in many wars. The dominions of the house of Savoy, placed as they were between France and the German Empire, whose jurisdiction extended over North Italy, rendered the position of the dukes extremely delicate, especially in the long wars which broke out in the sixteenth century between the house of Austria and France. The Duke of Savoy had the title of Imperial Vicar in Italy, and was by interest as well as duty attached to the Imperial cause; but the varying course of politics sometimes threw that interest into the opposite scale; and Piedmont and Savoy were thus frequently devastated by French, Imperialist, and Swiss armies.

Emmanuel Philibert (1553–1580) after rendering great service to the Emperor, and receiving favour from him, fixed his residence at Turin, and applied himself to restore order in every branch of the administration. He may be considered as the real founder of the monarchy of the house of Savoy. The states of Savoy, which had existed in the feudal period, became disused, being no longer convened. When he died he left Piedmont in a very flourishing condition. Charles Emmanuel I. (1580–1630), during his long reign of half a century, was almost constantly at war with Spain, France, or Switzerland, respecting disputed claims to territory. Victor Amadeus I. (1630–1637) obtained possession of the greater part of Montferrato, by the peace of Cherasco, in 1631. Charles Emmanuel II. (1637–1675) was a minor for several years after his father's death; and during his minority conflicting claims to the regency, aided respectively by France and Spain, kept Piedmont and Savoy in a state of warfare. The peace of the Pyrenees in 1659 terminated the Italian wars between France and Spain, which had lasted with little interruption for nearly 80 years. Duke Charles Emmanuel enjoyed peace during the remainder of his reign.

Victor Amadeus II. (1675–1730) greatly improved and strengthened his dominions during his long reign. After being involved for many years in the wars between France and the Emperor, he obtained, by the peace of Utrecht in 1713, the Valsesia, the territory of Lomellina, the remainder of Montferrato, and other districts, and above all the island of Sicily with the title of king, and he was crowned at Palermo, in December, 1713. By the subsequent treaty of London, Victor Amadeus gave up Sicily to the Emperor, and received in exchange the island of Sardinia with the title of a kingdom. Thus the house of Savoy became numbered among the royal houses of Europe. Victor Amadeus employed the peaceful period which followed to improve the administration, to recruit his finances, and to encourage agriculture and industry. Through his care the cultivation of the mulberry-tree and the rearing of silkworms attained in Piedmont that perfection which they still maintain; and he founded several colleges. Charles Emmanuel III. (1730–1773) took the titles of King of Sardinia, Duke of Savoy, Prince of Piedmont, &c. He was soon engaged in an alliance with France and Spain against Austria. In the war of the Spanish succession he took the part of Maria Theresa. He saw that the Bourbons had become powerful in Italy, and it was not his interest to favour their further aggrandisement. His policy and that of his successors was therefore to be allied with Austria and England, and to prevent the French from crossing the Alps. Piedmont again became the field of many sanguinary battles. By the peace of Aix-la-Chapelle the King of Sardinia obtained the upper Novarese, or Valli di Novara, and the districts of Voghera and Vigerano near the Po. The remaining twenty-five years of the reign of Charles Emmanuel III. were spent in peace, and employed in the cares of administration. He left to his successor a compact and extensive territory, a thriving population, a fine army, and a full treasury. His son Victor Amadeus III. (1773–1796), was less sagacious and less fortunate. The storms of the French revolution rendered the end of his reign calamitous. He lost Savoy and Nice in 1792, Oneglia in 1794; and in 1796 he was forced to conclude a hasty peace, which left his dominions at the mercy of the French. He died soon after, in October, 1796. Charles Emmanuel IV. (1796–1802) succeeded his father on a slippery throne. Savoy and Nice were united to France, and Piedmont was overrun by French troops who held the principal fortresses in their hands. As long as Bonaparte remained in command in Italy, he observed some degree of respect towards the King of Sardinia, but after his departure the generals, commissaries, and other agents of the Directory heaped insult upon insult on the fallen monarch, and exaction on exaction on his unfortunate subjects, until he was obliged to retire to Sardinia in 1799. In 1802 he abdicated in favour of his brother, Victor Emmanuel.

Victor Emmanuel (1802–1821), seeing no chance of being restored to his continental states, repaired to the island of Sardinia. In the year 1814 he returned to Turin, and took possession of the dominions of his ancestors, to which the Congress of Vienna added the Genoese territory. An insurrection among his nobles induced him to abdicate. Charles Felix (1821–1831), brother of Victor Emmanuel, supported by Austria, put down the insurrection in Piedmont, and restored the former system of monarchy. He occupied himself with the business of administration, and also in making new roads and other improvements. He left no male issue.

Charles Albert (1831-1849), a collateral relative of Charles Felix, succeeded, and had a peaceful reign till the European revolution of 1848 involved him in a contest with Austria. In Feb. 1848, he promulgated a constitution for his dominions, comprising a legislature of two Chambers, an annual convocation of the Chambers, a free press, and other reforms. The King joined the Milanese, Venetian, and other states, in opposition to Austria, in 1848-9, and even attempted to expel the Austrians altogether from Italy; but in this he failed, and in March, 1849, after his defeat by the Austrians at Novara, he abdicated in favour of his son, Victor Emmanuel, who immediately concluded a peace with Austria. Charles Albert died July 28, 1849, at Oporto.

SARDO'NICUS RISUS, a convulsive affection of the muscles of the face, in which the lips are drawn involuntarily apart, so as somewhat to resemble the expression of the countenance in laughter. The name is derived from a species of ranunculus that grows in Sardinia, called *Herba Sardonica*, which is said to produce this affection in those who eat it.

SARDONYX. [Agate.]

SAREPTA. [Saratow.]

SARK. [Guernsey.]

SARLAT. [Dordogne.]

SARMA'TIA was the name given by the Romans to all the country in Europe and Asia between the Vistula and the Caspian. It was bounded on the south by the Euxine and Mount Caucasus, and was divided by the Tánais into Sarmatia Europæa and Sarmatia Asiatica. The people inhabiting this country were usually called Saurómatæ (Σαυρομάται, by the Greeks, and Sármatæ by the Romans). But the Sauromatæ of Herodotus dwelt to the east of the Tánais, by which they were separated from the Scythians of Europe.

SAROS, NEROS, SOSOS. These names are from the fragments left of Berósus, who says that the Chaldæans had three astronomical periods so called, the Saros of 3600 years, the Neros of 600 years, and the Sosos of 60 years. Of the two latter we know nothing more, and as to the Saros, the duration given by Berosus is either entirely wrong, or else subsequent writers have taken another Chaldæan period, which is neither of the three above, and applied the term saros to it. Geminus (ch. 15) mentions that the Chaldæans had found a period of 669 months, or 19,756 days (so the text stands after an emendation by Bouillaud). Many writers confound it with the Metonic Period of 235 lunations, which is a totally different thing.

SAROTHAMNUS, a genus of plants belonging to the natural order *Leguminosæ*. *S. scoparius*, Broom, the only British species, is a well-known plant, with a stem 2 or 3 feet high. The pods are dark brown, hairy at the edges, and have numerous seeds. It is found on dry hills and heaths.

SARRACENIA'CEÆ, a natural order of plants placed by Lindley in the albuminous group of Polypetalous Exogens. It consists of herbaceous perennial plants inhabiting bogs, with fibrous roots and radical leaves, with a hollow urn-shaped or pitcher-shaped petiole, at the point of which is articulated the lamina, or blade of the leaf, which covers the petiole like a lid. There is only one genus belonging to this order, of which there are about six species, all of them inhabitants of the bogs and swamps of North America. Of their properties we know but little. They are chiefly interesting on account of their pitcher-like leaves, which are capable of holding water, and are thus said to furnish drink to wild animals in their native forests during periods of drought.

SARREALBE. [Moselle.]

SARREBOURG. [Meurthe.]

SARSAPARILLA, EAST INDIAN, a root used in medicine, and sold by druggists as a substitute for the true Sarsaparilla, under the above name. This is imported from India, and has been said by some to be the produce of *Smilax aspera*, a plant not known to be found within the limits of that country.

SARTENE. [Corsica.]

SARTHE, a department in France formed out of Haut-Maine and a small part of Anjou, lies between 47° 35′ and 48° 27′ N. lat., 0° 52′ E., and 0° 22′ W. long., and is bounded N. by the department of Orne, E. by Eure-et-Loire and Loir-et-Cher, S. by Indre-et-Loire and Maine-et-Loire, and W. by Mayenne. Its greatest length from N. to S. is 62 miles; from E. to W. 58 miles. The area is 2400 square miles, and the population in 1846 was 474,876, which gives 197.865 to the square mile, being 24.115 above the average for the whole of France.

The department takes its name from the river *Sarthe*, which rises near the ancient abbey of La Trappe, not far from Moulin-la-Marche, in the department of Orne. It flows first in a south-west direction till it reaches the northern boundary of Sarthe, along which it runs in a more westerly course; on reaching the western boundary it runs S. for about 2 miles between Sarthe and Mayenne, and thence S.S.E. past Frênay and Beaumont to Le-Mans, just below which it receives the Huisne and becomes navigable. The river then resumes the original south-west direction, and, passing out of the department below Sablé, it enters that of Mayenne, where it receives the Loir on the left and the Mayenne on the right, a little above Angers, below which the united waters take the name of Maine, and empty themselves into the Loire on the right bank at Ponts-de-Cé. With the exception of the *Huisne*, which, flowing out of Orne, drains the north-east of the department, and the Loir, which drains the southern and south-eastern districts, the feeders of the Sarthe are small. The Vegre and the Erve enter it on the right bank near Sablé. The *Braye*, a feeder of the Loir, runs for several miles along the eastern boundary. By the Sarthe and the Loir the department has an internal navigation of about 100 miles.

The department is generally level, and inclines gently to the south-west. The only hills worth naming are those on the western boundary between the Vegre and the Erve, and the low vine-clad chalk ridges that hem in the narrow valley of the Loir. The north of the department, and all

of it that lies on the right bank of the Sarthe, has a good soil which yields wheat, some maize, buckwheat, pulse, melons, and pumpkins. The fields are generally inclosed by hedge-rows in this part. The rest of the department lying between the Sarthe, the Loir, the Braye, and the Huisne, and for some distance from the right bank of the last-named river, has a poor light soil, resting upon chalk, and presents many bare sandy flats, some of which however are planted with pines. Rye is the most general crop in this district; but here and there manure and tillage succeed in raising other more valuable grains. Hemp and flax are cultivated all through the department wherever the soil is favourable for their growth. Clover seed is an important article of farm produce, and is exported largely to England and the north of Europe. Walnuts, excellent chestnuts, fruits of various kinds, are grown extensively, especially apples for making cider, the common beverage of the peasantry, of which about 5,000,000 gallons of inferior quality are made annually. The yearly produce of wine is about 2,000,000 gallons; it is all bad. There is a great breadth of meadow and open pasture land in the department, so that great numbers of horned cattle, sheep, and pigs, are fed. Horses are in general of small size: some mules are bred. Poultry is excellent, and forms an important article of export to Paris. In the arrondissements of Le-Mans, Mamers, and St. Calais, there are extensive forests. The climate is mild and healthy.

Iron mines are worked; red and yellow ochre, flint, marble, slate, millstone grit, limestone, sandstone, marl, and potters' clay are found; anthracite coal mines are worked in the west of the department. There is a salt spring at La-Suze. The manufactures, which are unimportant, comprise sailcloth, brown linen, printed cottons, blankets, cotton handkerchiefs, paper, leather, and iron. Above 180 fairs are held in the year.

The department is traversed by 7 national, 12 departmental, and 26 parish roads. The Paris-Brest Railway also crosses the department; it is now open to Chartres, about 15 miles W. by N. of which it turns S.W. to Le-Mans, whence it passes to Laval and Rennes nearly due west; from Le-Mans a line is in course of construction through Alençon (where it is joined by a branch line from Chartres) to Caen, and thence to the Paris-Rouen line. There are some Druidical monuments in this department; the most noteworthy are those at Connerré, a village N.E. of Le-Mans on the Huisne.

The department covers an area of 1,536,062 acres, distributed among 124,588 proprietors, and into 1,062,338 parcels. Of the whole surface 972,286 acres are arable land; 143,623 are grass land; 24,911 are under vine culture; 194,217 under woods and forests; 25,895 are occupied with gardens, orchards, and nurseries; 112,160 acres consist of heaths and moors; 10,334 are covered with rivers, canals, and other waters; 11,387 are under various culture; 40,250 acres are occupied by roads, streets, houses, buildings, &c.; and 813 acres by cemeteries, churches, and public buildings.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Le-Mans . .	10	128	171,908
Mamers . . .	10	145	131,366
St.-Calais . .	6	60	69,676
La-Flèche . .	7	80	101,926
Total . .	33	413	474,876

Of the arrondissement of Le-Mans and of the whole department the chief town is *Le-Mans* [Mans, Le.] *Ballon*, situated on a high hill on the left bank of the Orne, 10 miles N. from Le-Mans, has 2184 inhabitants; the old castle held by the English till the time of Charles VII., is now in ruins, with the exception of the keep. *E'commoy*, 14 miles S. by E. from Le-Mans, is a well-built town, consisting of several streets that abut on a wide central area, the middle of which is occupied by the market-house. The inhabitants number 3674, and manufacture linen, thread, pottery, tiles, and lime. The neighbourhood has a sandy but tolerably fertile soil, and is famous for its butter. *Loué*, a small place of 2000 inhabitants, is on the Vegre, 16 miles W. from Le-Mans. *Sillé-le-Guillaume*, a small but interesting old town taken by William the Norman in the eleventh century, stands in a fertile country, and at the foot of a hill crowned with the ruins of an ancient fortress. The town was formerly fortified, and it suffered frequently from siege in the wars between England and France. The church of Notre-Dame, built over a vast crypt, and the castle, are the most interesting structures. The castle was built in the 14th century; it is in excellent preservation, and is now the property of the town. It consists of an oblong square built round an interior courtyard, which is flanked by a massive keep and three smaller towers. The population of Sillé amounts to 3039; they manufacture fine linen and leather; and trade in hemp, thread, wool, feathers, corn, clover seed, poultry, cattle, honey, and wax. *La Suze*, 12 miles S.W. from Le-Mans, stands in a sandy country on the left bank of the Sarthe, and has 2133 inhabitants.

The arrondissement of Mamers takes its name from *Mamers*, a town 25 miles N.N.E. from Le-Mans, entered by four avenues and containing two handsome squares, on which several streets of well-formed houses abut. This town was formerly one of the strongest places in Maine, but every trace of its fortifications, which were rebuilt by the Normans in the 11th century, has disappeared. The English held it previous to the treaty of Bretigny; they afterwards took it in 1417, and during this occupation of it razed the fortifications. The church of Notre-Dame, formerly belonging to a Benedictine abbey, is the principal structure in the town, which has 5783 inhabitants, tribunals of first instance and of commerce, a council of Prud' Hommes, and a college. The manufactures comprise hempen and cotton cloths, woollen hosiery, pearl buttons, lea-

ther, beer, &c. *Beaumont*, on the slope of a hill on the right bank of the Sarthe, 15 miles S.W. from Mamers, is an ill-built place with crooked steep streets and 2320 inhabitants. The remains of the old castle, with its donjon keep now used as a prison, and the two bridges over the Sarthe, are the only things noticeable here. *Bonnetable*, anciently *Malestable*, situated in a very fertile country 13 miles S. from Mamers, is composed of two principal and parallel streets, which communicate by several lanes, and has 5163 inhabitants, who manufacture calico and cotton handkerchiefs, and trade in corn, clover seed, fruits, pulse, pigs, and cattle. The large and handsome market-houses, a heavy but well-preserved feudal castle, and the castle of Bonnetable situated on the right of the principal street, which is traversed by the road to Le-Mans, are the chief buildings. The last-mentioned castle, rebuilt and fortified by Jean de Harcourt in 1479, is girt with deep wide fosses, and flanked by six battlemented and machicolated towers: it passed from the Harcourts to the Bourbons, and now belongs to the house of Montmorency. *Ferté-Bernard*, an ancient town still girt with strong walls and with ditches, which are filled by the Huisne, is 12 miles E. from Bonnetable, and has 2583 inhabitants, who manufacture linen, cotton cloth, leather, tiles, &c., and trade in agricultural produce. The town is entered by an arched gateway, above which a small public library is kept; the principal street leads to the square, in which there is a handsome fountain and a pretty gothic church with a curiously-decorated interior. *Fresnay* or *Frênay*, an improving town of 3160 inhabitants, is situated on the slope of a hill above the left bank of the Sarthe, 16 miles W. by S. from Mamers. This town was formerly fortified; it was taken no less than four times by William the Conqueror; and in the wars between England and France it frequently suffered. The linen market-house and the town-hall, both modern structures, the remains of the old castle, and the parish church, one of the finest and purest specimens of the transition style of the 16th century, are the most notable objects at Frênay. A bridge across the Sarthe connects the town with a small suburb. Fine linen is the principal manufacture, of which about 6000 pieces are made and bleached annually.

Of the arrondissement of St.-Calais, the chief town is *St.-Calais*, which is situated in a hungry district, abounding with heaths and stunted woods, on the Anille, a feeder of the Braye, 29 miles E. by S. from Le-Mans, and has a tribunal of first instance, a college, and 3843 inhabitants. A gothic church, classed among French historic monuments, is the only building worth notice. Serge, sieve-cloths, linen, leather, tiles, and bricks are manufactured; and there is a little trade in wine, wood, poultry, cattle, and common agricultural products. *Besse-sur-Braye*, a small place on the right bank of the Braye, has 2000 inhabitants. *Bouloire*, built on the slope of a hill above the Tortue, a few miles W. from St.-Calais, has an ancient castle, and 2094 inhabitants. *Château-du-Loir*, on the side of a hill above the Loir, 22 miles S.W. from St.-Calais, consists principally of one long straight and well-built street, divided in the centre by a square. Narrow, crooked, and steep lanes of ill-built houses, and some small squares, in which the town-hall, the market-house, and the hospital stand, make up the rest of the town. Of its two ancient churches, that of St.-Guingalois is a handsome edifice. The old castle of the dukes of Anjou, to which this town owes its origin and name, has entirely disappeared. The rocks in the neighbourhood are hollowed so as to form cellars, and in many instances residences for the poor. Château-du-Loir has a population of 3029, and is the centre of an extensive manufacture of excellent linen; cotton yarn and leather are also manufactured; and some trade is carried on in wine, poultry, cattle, flax, hemp, corn, and large chestnuts. *Grand-Luce*, a town of 2354 inhabitants, 13 miles W. by S. from St.-Calais, is a regularly-built town, consisting of a square, into which the four principal streets run. A modern château, situated in a park inclosed by walls, occupies the site of the old fortress. *Vibraye*, 11 miles N. by W. from St.-Calais, in a district containing iron, and near a forest of the same name, has 3094 inhabitants.

The arrondissement of La-Flèche takes its name from *La-Flèche*, a well-built town, situated on the right bank of the Loir, in the midst of a plain, 25 miles S. by W. from Le-Mans. The town is well built; the principal streets are wide, and adorned with fountains, fed by an aqueduct; the houses are covered and many of them are faced with slates. On the left bank of the Loir, which separates the town from its suburbs, are seen the remains of one of the strongest fortresses in Anjou; it was given by Henri IV. to the Marquess de la Varenne. The most remarkable building in La-Flèche is the Jesuit college, founded in 1603 by Henri IV., whose heart is preserved in the church. It consists of four quadrangles, built round five courtyards, and has a fine park inclosed by high walls to the north of it. The college church and the library, which contains 25,000 volumes of valuable books and several good pictures, are much admired. The college was converted by Napoleon into a military school. The church of St.-Thomas, the town-hall, the court-house, the hospital founded by Henry II. of England in 1155, and the public walk along the Loir formed by fine elms, are deserving of mention. Though situated on a navigable river, and at the intersection of several great roads, the town presents but little industrial activity; linen, hosiery, glue, gloves, and leather are made; and there is some trade in corn, wine, nut-oil, hides, poultry, and cattle. La-Flèche has 7009 inhabitants, and is the seat of a tribunal of first instance. *Le-Lude*, 12 miles S.E. from La-Flèche, on the left bank of the Loir, is pretty well built, but the streets are crooked and irregular. There is a fine old château here, with enormous round towers. The population is 3295. *Mayet*, with a château of the same name, is 18 miles E. by N. from La-Flèche, and has 3724 inhabitants, who manufacture sail-cloth, drugget, and blankets. *Pont-*

valain, near which, on a spot now marked by an obelisk, Bernard Dugueselin routed the English in 1369, stands on the right bank of the Lone, a feeder of the Loire, 14 miles E. from La-Flèche, and has 2019 inhabitants. *Sablé*, a pretty town with 4348 inhabitants, is situated in a pretty country, 16 miles N.W. from La-Flèche, on both banks of the Sarthe, which is here spanned by a black marble bridge. The town stands on a hill, the summit of which is crowned by a fine château, built by Mansard for the brother of Colbert, on the site formerly occupied by one of the strongest castles in Maine, the only one which was not taken by the English in the invasion of the 15th century: the keep and two gate towers alone now remain. The parish church contains good specimens of glass painting. Gloves, hats, serge, and woollen yarn are made; near the town, quarries of black and variegated marble are worked, and also a mine of anthracite. Near Sablé is the fine old priory of Solesme, a structure of the 12th century.

The department forms with that of Mayenne the see of the bishop of Le-Mans. It is comprised in the jurisdiction of the High Court and University-Academy of Angers, and belongs to the 16th Military Division, of which Caen is head-quarters. Under the late monarchy it returned 7 members to the Chamber of Deputies; it now has 10 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850.)

SARTI, GIUSEPPE, a composer, was born in 1730, at Faenza. In 1756 he became Maestro di Capella at the court of Copenhagen: he afterwards composed for the court of Dresden; and finally entered into the service of Catherine of Russia, who treated him with a liberality truly imperial. After her death he was continued in his appointments and emoluments by Paul, her successor. His chef-d'œuvre, 'Giulio Sabino,' an opera, which was extravagantly applauded abroad, and is highly spoken of by Dr. Burney, did not succeed in London. Sarti produced about thirty operas, and also some sacred music. He died at Berlin, in 1802.

SARTO, DEL. *Andrea Vanucchi*, called *Andrea del Sarto*, from the occupation of his father, a tailor, was born at Florence, in 1488. He studied painting under Giovanni Barile and Pietro Cosimo. On leaving Cosimo he formed an intimacy with Francisco Bigio, with whom he executed some works in the public buildings of Florence, which gained him considerable reputation. He went to Rome, and after his return, he painted for the monastery of the Salvi his admired pictures of the Descent of the Holy Ghost, the Birth of the Virgin, and the Last Supper. Being commissioned to paint a picture for Francis I. of France, he sent in a Dead Christ, which is now in the Gallery of the Louvre. The king invited the artist to Paris, and he obtained considerable employment both from Francis and the nobility. As he was desirous of returning for a short time to Florence, the king not only granted him leave of absence, but entrusted him with large sums of money for the purchase of statues, pictures, and drawings. Andrea however, on returning to Florence, squandered away the whole of the king's money as well as his own. He was reduced to poverty, and died of the plague in 1530. The churches, convents, and palaces of Florence contain many of his best works.

SARUM. Old Sarum, situated about a mile and a half N. from Salisbury, is generally regarded as the Sorbiodunum of the Romans. Under the Anglo-Saxon and Anglo-Norman princes councils ecclesiastical and civil were held here, and the town became the seat of a bishopric. There was a castle or fortress, which is mentioned as early as the time of Alfred, and which may be regarded as the citadel; and the city was defended by a wall, within the enclosure of which the cathedral stood.

The rise of New Sarum [SALISBURY] led to the decay of the older place: so that in the time of Leland there was not one inhabited house in it. Nevertheless it continued to return members to parliament until it was disfranchised by the Reform Act.

The earthworks of Old Sarum are very conspicuous. They are on the right of the road from Marlborough to Salisbury, and consist of a circular or rather oval entrenchment; a smaller entrenchment of similar form within the first; and some earthen banks extending from the inner to the outer entrenchment, and subdividing the area between them. There are a few fragments of walls.

SARZANA. [GENOA.]

SASSAFRAS, the name of a genus of plants belonging to the natural order *Lauraceæ*. The species of this genus most known is the *S. officinale*, the Sassafras Laurel, on account of its medicinal virtues. It is an inhabitant of the woods of North America, from Canada to Florida.

It is mostly a small tree or bush, but sometimes attains the height of 40 or 50 feet. In America the Sassafras is divided into two varieties, the red and white. Its great use is for medicinal purposes. It is however employed in America for making bedsteads and other articles of furniture, which are not liable to the attacks of insects, and give out a very agreeable odour.

Medicinal Properties.—The root of the Sassafras Laurel is the officinal part in the London Pharmacopœia; but the whole plant possesses the aromatic odour common to the *Laurineæ*, and some assert that the bark of the stem and branches is stronger than that of the root; but this seems to be an error. The taste is sharp, acrid, aromatic, and, as well as the odour, resembles fennel. Sassafras acts as a stimulant to the circulation, especially of the capillaries, causing an increased secretion from the skin, if the person be kept warm, or from the kidneys, if cool. Should these organs fail to be influenced by it, heat and general excitement, with headache, are the results. It is of unquestionable utility in gout and rheumatism, but its activity is generally destroyed by the improper mode of administering it. Decoction dissipates the volatile oil, and is a most objectionable preparation. Infusion or a tincture may be used, or the volatile oil rubbed up with sugar.

SASSANIAN DYNASTY. [PERSIA.]

SASSARI. [SARDEGNA.]

SATARA. [SATTARA.]

SATELLITE (*satelles*, an attendant soldier or guard), a name given to the smaller planets which accompany and revolve round the larger ones. With this exception, that the rotation of a satellite round its own axis is made in the same time as its orbital revolution round its primary, in every case in which it has yet been fully made out that there is a motion of rotation, there seems to be no circumstance which can be pointed out in which the satellites have any distinctive peculiarities. The Earth has one satellite [MOON], Jupiter has four, Saturn eight, Uranus six, and Neptune one, as far as is yet known.

SATIN. [SILK.]

SATIN SPAR is a whitish, fibrous, translucent mineral, which occurs at Alston Moor in Cumberland, and in North America, in tabular masses of an inch or two in thickness, in veins in slaty clay and shale. It consists chiefly, if not altogether, of carbonate of lime.

SATIN-WOOD. [CEDRELACEÆ.]

SATIRE, a species of Roman poetry, which must not be confounded with the Satyric drama of the Greeks. The Latin word *Sátura* or *Sátira* appears to have originally signified a collection of various things, and accordingly this name is applied to food composed of various ingredients, and also to a law consisting of several distinct particulars of a different nature. The Roman satire is first mentioned as a kind of dramatic performance (Livius, vii. 2). This species of composition arose from the practice, which has prevailed in Italy from the earliest times to the present day, of the country people making rude extempore verses in ridicule of one another at various festivals, and especially at the time of vintage.

The name of satire was afterwards limited to a species of poetry peculiar to the Romans, in which Ennius is said to have been the first writer. Lucilius however was the first who constructed satire on those principles of art which were considered in the time of Horace as essential requisites in a satiric poem. Lucilius principally used the hexameter metre, which was afterwards almost exclusively employed by the satiric poets. His poems were not only satires upon the vices and follies of mankind in general, but also contained attacks upon private individuals. They formed the model on which Horace wrote his satires; but the circumstances of the times prevented Horace, even if he had the inclination, from attacking eminent political characters, as Lucilius had done. The increased corruption at Rome under the early emperors, and the cruel punishments which had been inflicted by Domitian upon the wise and the good, led Juvenal to attack the vices of his age with severity and vigour. The works of the other Roman satirists are lost, with the exception of those of Persius.

SATISFACTION, in Law, is said to exist where a party, having a right of action, accepts from the party against whom he has it, a certain and valuable thing, or the performance of a certain and beneficial act, in lieu of his right of action. If the action is afterwards brought, the satisfaction may be pleaded in bar of it. Satisfaction may exist as to actions in which damages are recoverable, and as to some others (Blake's case, 6 Co., 'Rep.,' 44; Peyton's case, 9 Co., 'Rep.,' 78); but it cannot operate so as to dispense with the performance of a covenant under a deed, by reason of the rule of law that a deed can only be made void by an instrument of the same nature. But if a right of action upon the deed has accrued, as in the case of a breach of covenant to repair, to pay rent, &c., there may be satisfaction.

SATRAP, in Greek σατράπης, was the name of the governor of a province under the old Persian Empire. The duties of a satrap are described by Xenophon in the Cyropædia (viii. 6, s. 1–3). 'Satrap' is undoubtedly a Persian word, but oriental scholars have given very different explanations of it.

SATTARA, or SATARA, a city of Hindustan, the capital of the small state of Sattara, is situated in the province of Bejapor, in 17° 40′ N. lat., and 74° 3′ E. long., 57 miles south from Poonah in a straight line. Sattara is a small town on a rocky and precipitous mountain, with a fortress of great strength, and a handsome palace built by the Raja after he came under the protection of the British. The Mahratta ancestors of the Raja were deprived of their power by the Peishwa in 1689. The British however captured Sattara in 1818, and restored it and the territory to the Raja, Purtaub Sing, who continued in possession of the state till 1835, when he was accused, by the resident at Sattara, of a treasonable intercourse with the Raja of Nagpoor and the Portuguese authorities at Goa, and with attempting to seduce the native troops from their allegiance to the British government. The charges were investigated by Sir Robert Grant and his colleagues in the government of Bombay, and having been substantiated, the Raja was deposed. He died at the latter end of 1849, after having made many attempts in vain to get his sentence reversed.

SATURATION. When common salt, or indeed most other saline and many vegetable bodies, are added to water until it ceases to dissolve them, the solution so obtained is termed a saturated solution of the substance dissolved.

Saturation may exist with regard to one body and not to another. Thus water saturated with common salt will still dissolve sulphate of soda, and vice versâ; so also a saturated solution of common salt will dissolve sugar. There are many other cases in which the point of saturation may be determined by the cessation of solution; while there is a third class in which saturation cannot be determined by insolubility; as when both bodies are employed in a fluid state, or when the excess of a solid body is soluble in the water which holds the saturated salt in solution. The saturating power of bodies is in many cases greatly influenced by heat, while in others variation of temperature produces but little effect; thus cold water will take up nearly as much common salt as hot water; but sulphate of soda is more soluble in hot water than in cold.

SATURDAY. [WEEK.]

SATURN, the name of one of the old planets, the largest of all the bodies of the solar system, except the Sun and Jupiter. The planet itself is of a spheroidal figure, the axis of revolution being to the equatorial diameter in about the proportion of 11 to 12. It is accompanied by two rings of solid matter, unconnected with the planet and each other, but revolving round the former; these, not being usually called satellites, are, we suppose, to be considered as parts of the planet, though the former denomination would perhaps be more correct. There are also eight satellites (the last only recently discovered). There are also, as in Jupiter, certain thin zones or belts on the surface of the planet, though they are not always seen.

The apparent equatorial diameter, at the mean distance from the earth, is about 16″.2: the real diameter, that of the earth being 1, is 9.982, or about 79,000 miles, which gives a bulk of about 995 times that of the earth. The mean density is about .55 of that of the sun, or one-eighth of that of the earth; and the mass of the planet is about 1-3512th of that of the sun. It revolves on its axis in .428 of a day, or 10 hours, 29 minutes: its equator is inclined to the ecliptic at an angle of 31° 19′. Its light and heat are to those of the earth as 11 to 1000; its sidereal revolution is 10759.2198174 mean solar days.

The first six satellites move nearly in circular orbits (though that of the sixth is said to be sensibly elliptical) round the planet, their circles being exactly (or very nearly) in the plane of the planet's equator, which is also that of the rings. The seventh satellite, which is much the largest (and which is known, by William Herschel's observations, to revolve on its axis in the same time as its revolution in its orbit), moves more nearly in the plane of the ecliptic than in that of the planet's equator, and has a sensibly elliptical orbit. This is all that is known; for while on the one hand the difficulty of seeing the satellites so as to get good measures has prevented an accumulation of proper observations, the ring on the other hand presents by its attraction a new disturbing force, the complete effects of which, in the absence of sufficient observations, it has not been thought worth while to trace.

The farthest satellite but one of the older ones, and the largest but one (now called the sixth), was the first discovered, by Huyghens, in 1655. As soon as the five last satellites were discovered, and until the time of Herschel, they were called the first, second, &c., in the order of their distances from the planet. This old nomenclature was gradually abolished after the discovery of a sixth and a seventh satellite by Herschel, being in reality the first and second in order of distance. Some confusion however has ensued in various places: thus, in the article Astronomy, ii., 333, 335, it is said that Cassini discovered the first and second satellite, and also that Herschel did the same. Both assertions are true, inasmuch as Cassini discovered what were the first and second satellites (now the third and fourth), and Herschel discovered what immediately became the first and second satellites in right of their position. The eighth satellite was discovered simultaneously by Mr. Lassell, in England, and Mr. Bond in the United States, in September, 1848.

The rings are solid circular bodies, rounded, it would seem, at the edges, and two in number, having a motion of revolution round their centres, which is completed in ·428 of a day, or 10 hours 16 minutes, or about 13 minutes less than the rotation of the planet itself: this is also the time in which a satellite would revolve at the same distance from the planet as the middle part of the ring.

SATURNA'LIA, a festival celebrated by the Romans in honour of the god Saturnus. It was probably instituted at Rome about B.C. 497. The Saturnalia were celebrated annually on the 19th of December, but after C. Julius Cæsar had added two days to this month, the celebration was on the 17th. Augustus sanctioned the extension of the festival from one day to three, and Caligula and Claudius made it four days. The Saturnalia was a season of jollity and licence, during which slaves had a holiday, and were allowed almost unrestrained liberty.

SATURNI'NUS, a name of several Roman jurists.

Claudius Saturninus is the name of a Roman to whom two Rescripts of Antoninus Pius are addressed ('Dig.' 20, tit. 3, s. 1, s. 2; 50, tit. 7, s. 4). He is generally considered to be the author of a work in a single book, 'De Pœnis Paganorum,' which in the Florentine Index is attributed to Venuleius Saturninus. There is a single excerpt from this work in the 'Digest' (48 tit. 19, s. 16).

Quintius Saturninus is cited in the 'Digest' (34, tit. 2, s. 19, s. 7) as the author of a work 'Ad Edictum,' in ten books at least. Whether he is the same as Claudius or Venuleius, or is a third person, is uncertain.

Venuleius Saturninus, a Roman jurist, who is simply called Venuleius in the Florentine Index, though in the titles of the Excerpts in the 'Digest' he is often called Venuleius Saturninus. Lampridius ('Alexander Severus,' 68) says that he lived under Alexander Severus; but there is some doubt about his period. His writings mentioned in the Florentine Index are, Ten Books of Actiones, Six of Interdicta, Four on the Office of Proconsul, Three on Publica Judicia, and Ninteen of Stipulationes. The book 'De Pœnis Paganorum' has been already mentioned.

SATU'RNUS, one of the principal divinities of the ancient Italians, was considered the protector of agriculture, whence he is generally represented with a sickle in his hand. His name probably contains the same element as the verb *sero* (sa), whence he was considered as the protecting divinity of all that was sown and planted. The Italian legends represented him as having come from abroad to the shores of Italy, in the reign of Janus, by whom he was hospitably received. Notwithstanding this, Saturnus was always considered as the first king of the Aborigines, probably because agriculture and civilisation in Italy dated from his reign. He taught the Italians the art of cultivating the fields, and led them from

their savage state to the peaceful occupations of civilised life, so that the whole land of Italy was called, after him, Saturnia. His rule was so just and mild, that the age in which he reigned was afterwards described as the golden age of Italy. His wife, called Ops, was in aftertimes worshipped as the goddess of plenty.

SATYR (Sátyrus) is the name by which the Greeks and Romans designated a class of rustic deities. Like the Panes and Fauni, they were a kind of intermediate beings between men and animals, and the features which they had in common with animals were chiefly derived from goats.

SAULIEU. [Côte-d'Or.]

SAUMUR. [Maine-et-Loir.]

SAUNDERSON, DR. NICHOLAS, an English scholar, particularly distinguished by the extent of his acquirements in classical learning and mathematics, under the disadvantageous circumstance of having become blind from the small-pox at the age of twelve months.

He was born in 1682, at Thurleston in Yorkshire, and at an early age he attended the free-school at Penniston, where he was taught the rudiments of the Latin and Greek languages. When he was about eighteen years of age, his friends, perceiving his talents, exerted themselves to communicate to him instruction in algebra and geometry; and, from this time, his progress in the sciences became rapid. His application to mathematics did not however prevent him from continuing to cultivate the study of classical literature; and it is stated that, besides making himself familiar with Cicero, Virgil, and Horace, he became enabled to understand the works of Euclid, Archimedes, and Diophantus, when read to him in the original Greek.

Mr. Saunderson having decided on making an effort to establish himself at Cambridge as a teacher, went to that university in 1707. He resided in Christ's College, and immediately commenced a series of lectures on the Universal Arithmetic, the Optics, and the Principia of Newton. The peculiar circumstances under which Saunderson taught, and his great talents, procured for him many pupils, and were the means of bringing him into an intimacy with the great mathematicians of that time. When Whiston was removed from his chair, in 1711, Mr. Saunderson was appointed to succeed him; and in 1723 he married a daughter of the Rev. Mr. Dickens, rector of Coxworth. In 1728, when George II. visited the university, Saunderson was, by the royal authority, made Doctor in Laws.

Dr. Saunderson continued to enjoy good health till near the end of his life. He died on April 19, 1739.

This extraordinary man composed, in writing, for the use of his pupils, several lectures on different subjects in natural philosophy, but they were never prepared, nor perhaps intended, for publication. A valuable treatise, which he had composed on the elements of algebra, appeared at Cambridge in 1740, in 2 vols. 4to.; and another on fluxions in 8vo., including a commentary on some parts of Newton's 'Principia,' came out in the year 1756.

SAURIANS (*σαῦρος*, or *σαύρα*, a lizard), the term by which the great family of Lizards is generally designated. The animal forms more strictly included under it are those comprised under the genus *Lacerta* of Linnæus (after deducting the Crocodilians and the Salamanders), and under the genus *Draco* of the same author. To these, Cuvier observes, the family *Anguis* might even be joined, because their osteology, especially that of the head, resembles the osseous structure of many of the Lizards. In the large acceptation of the term *Saurians*, the Pterodactyles, Enaliosaurians, and Crocodiles, are included. [Reptiles.]

Messrs. Duméril and Bibron, in their 'Erpétologie Générale,' divide the Saurians into the following groups or families:—1, The Crocodiles; 2, the Chameleons; 3, the Geckos; 4, the Varanians; 5, the Iguanians, embracing two subfamilies, Les Iguaniens Pleurodontes and Les Iguaniens Acrodontes; 6, the Lacertians, embracing two subfamilies, Les Autosaures Pléodontes and Les Autosaures Cælodontes; 7, the Chalcidians, embracing two subfamilies, Les Cyclosaures Ptychopleures and Les Cyclosaures Glyptodermes; 8, the Scincoidians, comprising three subfamilies, Les Saurophthalmes, Les Ophiophthalmes, and Les Typhlopthalmes. These groups and subfamilies are again divided into numerous genera, some of the most remarkable of which are noticed under their respective heads in the present work.

If we except from these groups the Crocodiles, or rather if we take the living forms collected under the genera *Lacerta* and *Draco* of Linnæus, excluding the Crocodiles on the one hand, and the Newts or Salamanders on the other, we shall find that all the animals have a similar structure of the skull, the shoulder blade, and of the *os hyoides*; or that they exhibit but slight variations in the composition and proportion of the parts, whilst they differ considerably from the Crocodiles and Tortoises, as Cuvier, with his usual acuteness, has remarked. According to this great comparative anatomist, the common characters, with regard to the osteology of the head, consist principally of the following points:—

1. The four ordinary occipital bones form the ring which surrounds the encephalon backwards. The lateral occipital is not divided into two, as in the Tortoises. In front of the occipital bones are placed the sphenoïd below, and the os petrosum laterally: the parietal covers the whole like a roof.

2. The sphenoïd bone is visible throughout its inferior surface; the pterygoïdians, forming a simple continuation of the palatine bones, are prolonged to the internal border of the tympanic cavities (caisses), not touching the sphenoïd, except upon a lateral tuberosity of that bone, and not uniting together.

3. The sphenoïd is prolonged forwards into a cartilaginous stem upon which the interorbitary partition is elevated; and in this last, various points of ossifications show themselves, which belong to the ethmoïd bone.

4. The bone analogous to the os petrosum, which is not hidden by the tympanic cavity, is extended outwards, and forms, between the sphe-

noïd and the occipital bones, the whole of the posterior lateral wall of the cranium.

5. The anterior lateral wall of the cranium, from the os petrosum to the interorbitary partition, is membranous, and contains only on each side a bone of various configuration according to the species, the temporal ala and the orbitary ala.

6. An osseous stem rises from the upper border of the pterygoïdian, where it is articulated in a fosset up to the lateral or parietal border, to which it is attached by a ligament. Some anatomists, says Cuvier, have thought that they saw in it the analogue of the temporal ala, but it does not fulfil the functions of that process; others have named it tympanic, without even a perceptible motive, however distant, for such a determination. One cannot even say that it is properly comprised in the wall of the cranium, and this wall has also sometimes in the thickness of its membranes a point of ossification which represents the true temporal ala. Cuvier then states that he would call this bone the columella. Its function is to sustain the vault of the cranium, which is not otherwise supported in front, because the orbital ala, the temporal ala, and the ethmoïd bone are in a considerable degree membranous.

7. The lateral occipital bone has a part projecting outwards, to which are united, by their extremities, the mastoïdian, which is very much reduced, and the temporal bones; to this common reunion of the three bones is suspended the tympanic bone, which descends vertically to serve as a pedicle to the lower jaw. This bone, most frequently, is not attached, except to the anterior edge of the tympanum; and the rest of the contour of that membrane, as well as the posterior wall of the tympanic cavity, is cartilaginous or even only simply membranous.

The Eustachian tube is only a wide communication of the tympanic cavity to the posterior part of the mouth, between the extremity of the pterygoïdian and the sphenoïd. In the recent animal it answers to that part of the inside of the mouth near the articulation of the jaws, and the communication is sometimes so open that the ossiculum auditûs may be said to be in the mouth or in the pharynx. The cavity of the vestibule is formed in common by the os petrosum, the lateral occipital, and the superior occipital. The fenestra ovalis, where the ossiculum auditûs is attached, is common to the os petrosum and the external occipital. Under it is a wider aperture, pierced in the lateral occipital bone only, and at the bottom of which are two holes, one anterior, which goes into the cranium, and one posterior, which is the fenestra rotunda, and leads into a fosset of the vestibular cavity, which represents the cochlea.

8. The transverse bone unites the pterygoïdian bone to the jugal and the maxillary, as in the crocodile.

9. The palatine bones have no palatine laminæ, or, at least, these laminæ are not sufficiently extended to unite; and the posterior bony nostrils are great holes in the anterior part of the vault of the palate, between the maxillary bones, the vomers, and the palatine bones.

10. The extremities of the external bony nostrils are always separated in the skeleton by an internasal apophysis of the intermaxillary and sometimes of the maxillary bone.

For the rest, the division of the frontal bone into the principal, the anterior, and the posterior, and the other osteological circumstances, are as in the tortoises and crocodiles.

The lower jaw of the Saurians is composed of six bones on each side, as in the crocodile and tortoise, but rather otherwise disposed, and producing a general form which is somewhat different; thus the coronoïd apophysis projects very much, and is placed more forward; the lower angle has also a more forward position, and the dental part is shorter in proportion.

The dental bone does not carry the teeth in alveoli or sockets, as in the crocodile, but they adhere to its internal surface. Its external surface is united backwards by a squamous suture to those of the complementary, the surangular, and subangular portions. The part of the internal surface of the dental bone, which the opercular bone covers below and behind the teeth, varies much in extent in different subgenera. The opercular bone is united backwards to the internal surface of the complementary, the articular, and angular portions, and often to that of the surangular portion.

The complementary portion forms alone the great coronoïd apophysis, extends on the upper edge of the jaw in front of that apophysis, and descends backwards to the internal surface, where it traverses the surangular portion to unite itself with the articular portion.

The articular portion furnishes the glenoïd facet, and the apophysis, which is behind it, for the digastric muscle, and has often even a small epiphysis at the extremity of this apophysis; it advances to the internal surface, and sometimes along the inferior border to the opercular bone.

The angular portion extends under that portion of the lower border which is between the lower angle on one side, and the dental or opercular portion on the other. It is not always that the angle of the jaw entirely belongs to this, for the opercular bone sometimes contributes to form it.

The surangular portion occupies nearly the whole of the external surface of the superior moiety between the four other bones which are seen on this aspect. It forms the upper border between the coronoïd apophysis and the articulation.

For the entrance of the nerves and vessels there is a great opening on the internal surface of the coronoïd apophysis, between the complementary, the surangular, and the articular portions; and for their exit there are holes at the external surface of the dental bone and on the internal surface of the opercular bone. The number and the position of these holes vary according to the subgenera and species. The surangular portion generally has two.

Such are the general dispositions, noticed by Cuvier, common to all the Saurians; and he proceeds to point out the principal differences observable in the subgenera.

It is interesting to trace in the Saurians the gradual deterioration and abolition of the extremities, till the form becomes completely serpentine. In *Heterodactylus* there are still five fingers; but the first finger of the anterior feet is so very short as to be rudimentary. In *Chalcis* (*Cophias*, Fitzinger) there are five toes before, but only three, reduced to tubercles, behind. In *Saurophis* the toes on each of the feet are reduced to four. In *Chamæsaura* there is but one on each foot. In *Chirotes* the anterior extremities are short indeed, but five-toed; the posterior extremities are altogether absent. In *Bipes* the hind feet are each terminated by two unequal processes or toes. In *Pygopus* the anterior extremities are also lost, and the posterior extremities appear in the form of a foot in which no toe is to be seen externally; and in the *Scheltopusiks* all trace of external extremities is lost, though the rudiments of posterior extremities may be seen attached to the pelvis.

[Acontias; Amphisbæna; Chirotes; Scheltopusik; Saurophis; Chalcides; Ophisaurus; Bipes; Scincoidians; Chameleons; Dragon; Gecko; Iguana; Monitor; Sauvegarde; Iguanodon; Hylæosaurus; Mosasaurus; Thecodontosaurus; Palæosaurus; Megalosaurus; Pterodactyle; Ichthyosaurus; Plesiosaurus; Crocodile; &c.]

SAURIN, JOSEPH, a mathematician and natural philosopher, was born in 1659 at Courtaison in the principality of Orange, where his father was the minister of a Protestant congregation. The son was also called to the ministry at Eure at Dauphiné before he was 24 years of age; but having in one of his discourses censured the government somewhat too severely, he was obliged to retire into the canton of Bern, where he obtained the curacy of Berchier in the bailliage of Yverdun. Circumstances, which have been differently related by his friends and enemies, obliged him to take refuge in France, where, in 1690, he abjured the doctrines of the Calvinists. After his recantation, having, through the interest of Bossuet, obtained a pension from the king, he devoted himself to the study of the mathematical sciences; and between 1702 and 1708 he wrote several papers which were published in the 'Journal des Savans.' He became a member of the Académie des Sciences in 1707, and between 1709 and 1727 he enriched its 'Mémoires' with numerous mathematical and philosophical papers, among which are some containing profound investigations relating to the curves of swiftest descent, and dissertations, conformably to the Cartesian hypothesis, on the force of gravity.

Saurin was imprisoned for a time on the accusation of J. B. Rousseau of being the author of certain profane and defamatory verses, with the composition of which Rousseau himself had been charged. [Rousseau, J. B.] Saurin died Dec. 29, 1737.

SAURIN, JAMES, a French Protestant divine, was born at Nismes, Jan. 6, 1677. He finished his education at Geneva, after having borne arms for a short time in the English service. In 1701 he was pastor of the Walloon church in London, whence, after four years, he went to the Hague, and remained there in the exercise of the ministry until his death, Dec. 30, 1730.

As a preacher he is ranked at the head of the French Protestants. He published five volumes of sermons, to which seven volumes were added after his death. His other chief works are, 'On the State of Christianity in France,' and 'Discourses, historical, theological, and moral, on the principal events of the Old and New Testaments,' 2 vols. fol. (known as Saurin's Bible), to which four volumes by other hands were added after his death. In these is contained the 'Dissertation sur le Mensonge Officieux,' which occasioned many disputes and much trouble to the author.

SAU'ROPHIS, Fitzinger's name for a genus of Lizards belonging to the group of *Chalcidian Lizards*, or *Cyclosaur Saurians*.

In this slender snake-like form the limbs are very minute, terminating in four very little toes; femoral pores; a furrow on each side along the neck and the trunk. Example. — *Saurophis Lacepedii*, Duméril and Bibron; *Lacerta tetradactyla*, Lacépède. Locality, South Africa.

We may here notice another anguiform Saurian, also from South Africa. We allude to the *Chamæsaura anguina*, in which the four short limbs are terminated each by a single unguicular toe.

SAURURA'CEÆ, a natural order of plants belonging to the Achlamydose group of Incomplete Exogens. It consists of only a few genera, which are aquatic or marshy herbs or herbaceous plants. They are natives of North America, China, the north of India, and the Cape of Good Hope, where they are found growing in marshes and pools of water. Their properties are not well known, but they seem to be the representatives of the peppers; and on account of their less exposure to light and heat, their secretions are not so strong and their properties not so active as their allies in the tropics.

SAURUREA, a genus of composite plants belonging to the sub-order *Cynarocephaleæ*. *S. alpina* is the only British species: it is found in alpine situations.

SAUSSURE, HORACE BENEDICT DE, was born at Geneva, Feb. 17, 1740. At the age of 22 he was appointed professor of philosophy in the college of Geneva, where he had been educated, and he there performed the duties of a public teacher for twenty-five years, interrupted only by his travels in search of physical knowledge, especially geological.

He says of himself, when speaking of his travels: —'I have traversed the entire chain of the Alps fourteen times, by eight different routes. I have made sixteen other excursions to the central parts of the mountain mass. I have gone over the Jura, the Vosges, the mountains of Switzerland and of part of Germany, those of England, of Italy, and of Sicily and the adjacent islands. I have visited the ancient volcanos of Auvergne, a part of the Vivarais, several of the mountains of Forez, of Dauphiné, and of Burgundy.' In addition it deserves to be particularly mentioned, that in 1787 he ascended to the top of Mont Blanc, and remained

there three hours and a half, making observations; in 1788 he encamped for seventeen days on the summit of the Col du Géant, at an elevation of 11,170 feet, for the purpose of studying meteorological phenomena; and in 1789 he reached the summit of Mont Rosa in the Pennine Alps.

Saussure resigned his professorship in 1786. He was afterwards a member of the Council of Two Hundred of Geneva; and when that republic was united to France in 1798, he was for some time a member of the National Assembly. The French Revolution however deprived him of almost all his property, which had been deposited in the public funds. He died Jan. 23, 1799.

The labours of Saussure in geology are of a character to secure for his name a just and enduring reputation. He also directed his attention to botany, chemistry, electricity, and meteorology; and he was the inventor of several ingenious and useful philosophical instruments. He wrote several works, the chief of which is his 'Voyages dans les Alpes,' published in 1779, 1786, and 1796. The title of this work conveys a very imperfect notion of its contents, which indeed embrace the whole of those geological travels which have been before alluded to.

SAUSSURITE, *Axe-Stone*, *Jade*, is a tough, greenish-white, opaque, uncrystallised mineral. Before the blow-pipe it fuses with difficulty into a white glass. It is found on the borders of the Lake of Geneva, and also in Styria, Corsica, and at Madras. It consists chiefly of silica, alumina, and oxide of iron.

SAUVAGES, FRANÇOIS-BOISSIER DE, was born at Alais in Lower Languedoc, in 1706. In 1722 he commenced the study of medicine at Montpellier, and he took his doctor's degree in 1726. In 1730 he went to Paris, where he conceived the idea of forming a classification of diseases like those usually adopted for the objects of natural history. He published a sketch of his system in a small volume in 1731, and by this, and some papers which he wrote at the same time, gained so much reputation, that in 1734 he was appointed a professor at Montpellier. In 1740 he was elected professor of botany, and subsequently pursued that science with as much energy as that of medicine. In 1763 he published the most important of his numerous works, the 'Medical Nosology,' in accumulating materials for which he had steadily laboured for upwards of thirty years. He died in 1767.

SAUVAGE'SIEÆ, a natural order of plants formed by Bartling, and consisting only of the genus *Sauvagesia*, of which there are six or seven species. Another genus, *Luxemburgia*, was referred to this order by Bartling, but this has been placed by De Candolle in *Frankeniaceæ*. One of the species, *S. erecta*, Upright Sauvagesia, is held in great repute as a medicine in South America. It is very mucilaginous, and has a bitter taste.

SAUVEGARDE, the name by which the Monitory Lizards or Safeguards of the New World are known (*Salvator* of MM. Dumeril and Bibron, *Podinema* and *Ctenodon* of Wagler, *Podinema* of the Prince of Canino, *Tejus* of Mr. J. E. Gray).

Generic Character.—Tongue with a sheathing base, very long, very extensible, divided at its extremity into two slender smooth filaments, with rhomboidal papillæ. Palate edentulous. Intermaxillary teeth slightly flattened from before backwards, with two or three notches at their summit. First maxillary teeth *en crocs*. The succeeding ones straight, compressed, tricuspidate in youth, tuberculous in old subjects. Nostrils opening on the sides of the extremity of the muzzle, between a naso-rostral, a naso-frenal, and the first upper labial plates. Eyelids. The tympanic membrane extended on a level with the aperture of the ear. Skin of the lower region of the neck forming two or three transverse simple folds. Back covered with small angular, smooth, non-imbricate scales, disposed in transverse bands. Ventral plates flat, smooth, quadrilateral, oblong, and quincuncial. Femoral pores. Each foot terminated by five toes, slightly compressed, and not carinated below; two of the posterior toes having a small dentilation on their internal border. Tail cyclotetragonal, a little compressed backwards.

Safeguard (*Salvator Merianæ*).

Localities, Habits, &c.—The warm countries of America are the native places of these Lizards, which arrive at a considerable size, often measuring as much as four or five feet in length. MM. Dumeril and Bibron state that they ordinarily inhabit the fields and the borders of woods, although they never climb trees; but they also appear to frequent sandy, and, consequently, arid tracts, where they are said to excavate burrows, in which they lay themselves up for the winter. When, in their flight to avoid pursuit, they come upon a lake, pond, or river, they plunge in, according to D'Azara, to escape from the danger which menaces them, and do not leave the water till all fear of danger is past. These Lizards, observe MM. Dumeril and Bibron, have not, indeed, webbed feet; but their long and slightly-compressed tail becomes, without doubt, under such circumstances, a sort of oar, of which they well avail themselves. D'Azara states that they feed on fruits and insects, and that they also eat serpents, toads, young chicks, and eggs. He also relates that they are fond of honey; and that, in order to procure it without fear of the bees, they come forward at intervals, and, as they run away each time, give the hive a blow with their tail, till by repeated attacks they weary out the industrious insects, and drive them from their home. MM. Dumeril and Bibron remark that they have been

unable to assure themselves that the Safeguards are frugivorous; but they are certain that they feed on insects, because they found remains of them in the stomachs of all the individuals which they opened. Once only among the fragments of *Coleoptera* and the remains of caterpillars they found portions of skin and bones which had certainly belonged to a common *Ameiva*.

MM. Dumeril and Bibron divide the Safeguards into two species, *Salvator Merianæ* and *Salvator nigropunctatus*; and they think that to *Salvator* should be referred Kaup's genus *Exypneustes*, which, vague as are its characters, seems to them to have for its type one of the two species abovementioned. These two Safeguards, they observe, though very easily distinguished when the true characters proper to each are well apprehended, bear nevertheless so great a resemblance to each other, that it is by no means surprising that they have been confounded together. In fact, it was not till after the publication of the work of Spix on the animals of Brazil that these species were mentioned as different.

SAUVEUR, JOSEPH, was born March 24, 1653, at La Flèche, where his father followed the occupation of a notary. Till he was seven years old he was quite dumb, and his organ of voice was never completely developed. He was sent to a school of the Jesuits, but his taste for calculations diverted his mind from rhetoric and theology; and happening to obtain a treatise on arithmetic, he made himself master of its contents; as he did afterwards of Euclid's 'Elements.' He afterwards taught the mathematics; and at twenty-three years of age he had the good fortune to attract the notice of Prince Eugene, who received from him some instruction in the sciences. From 1678 to 1680 he was occupied with the study of problems relating to the application of the theory of probabilities to games of chance, and in the latter year he was made mathematical master to the pages of the Dauphiness. In 1681 he was appointed, with Mariotte, to go to Chantilly in order to make some hydraulic experiments at that place; and it was there probably that he was introduced to the Prince of Condé, whose conversation appears to have inspired Sauveur with a desire to make himself master of the art of fortification; and in order that he might join practice to theory, he went in 1691 to the siege of Mons, where he attended daily in the trenches. At the termination of the siege, he visited the fortified places in Flanders, and at the same time he applied himself to the study of military tactics in all its details. At the recommendation of Vauban, he was appointed examiner of the engineers, and was allowed a pension, which he enjoyed till his death.

After his return to Paris he was appointed, in 1686, to the chair of mathematics in the Royal College; and in ten years afterwards he was made a member of the Académie des Sciences. During the remainder of his life he was employed constantly in improving the mathematical theory of sound; and he may indeed be said to have almost invented the science of acoustics. Theoretical music had been the subject of part of his lectures at the Royal College in 1697; but the first published details respecting his researches in acoustics are contained in the volume of the Académie for the year 1700. The different papers which he wrote afterwards are in the volumes for 1702, 1707, 1711, and 1713. Sauveur was twice married, and he died July 9, 1716.

SAUZON. [Belle-Ile-en-Mer.]

SAVAGE, RICHARD, born Jan. 10, 1697-8, was the son of the Countess of Macclesfield, but was declared illegitimate by act of parliament. He was brought up in obscurity, sent to a small grammar-school near St. Albans, and afterwards placed by his mother with a shoemaker in London. Soon after this he became acquainted with the circumstances of his birth, and made many efforts to obtain an interview with his mother, who however resolutely refused to see him. At the age of eighteen he published a comedy called 'Woman's a Riddle;' and two years afterwards another, 'Love in a Veil,' both borrowed from the Spanish. These were failures, but he succeeded better with his tragedy of 'Sir Thomas Overbury,' in which he himself performed; and the profits of this play, and of a subscription raised for him at the time, produced a considerable sum. In 1727 his irregular habits of life led him into a tavern broil, in which he unfortunately killed a man, and for which he was tried and condemned to death. Intercession was made for him with the queen of George II. by the Countess of Hertford, and the royal pardon was granted to him, in spite of the efforts of his mother to prevent it.

The publicity given to the events of his life created much sympathy in his favour, and he soon afterwards obtained an annuity of 200*l.* a year from his mother's relations. At this time he published his longest poem, 'The Wanderer,' which was much admired at the time. His fair prospects however were soon afterwards clouded by a quarrel with his patron Lord Tyrconnel, who accused him of ingratitude, and banished him from his house. His acquaintance in consequence generally deserted him, and he sank again into obscure poverty. In despair of ever conciliating his mother, he published 'The Bastard,' which is by far the best of his works. After an unsuccessful attempt to obtain the situation of poet-laureat, Savage received from the queen a pension of 50*l.* a year, as a reward for a poem in honour of her birthday, which his gratitude renewed annually from this time till her death, when the royal bounty was withdrawn from him. He was now, in 1739, obliged to leave London, retiring first to Bristol, and then to Swansea. In January, 1742-3, on his return to Bristol, he was arrested for a debt of 8*l.*, and sent to prison in that city, where he died, July 31, 1743.

The name of Savage has become better known than his merits deserve, from the singularity of his early misfortunes, and still more from the elaborate life of him which Johnson, the companion of his distresses, has inserted in his 'Lives of the Poets.'

SAVANNAH. [Georgia.]

SAVANNAS. [Plains.]

SAVARY, NICOLAS, was born in 1750, at Vitré in Bretagne, France. Having completed

his studies at the college of Rennes, he went to Paris, where he resided for some time. He had early conceived a desire of travelling, and in 1776 he landed in Egypt, where he remained till September 1779, when he re-embarked at Alexandria, and travelled for about two years among the islands of the Grecian Archipelago, and then returned to France.

The first work which Savary published after his return was 'Le Coran, traduit de l'Arabe, accompagné de Notes, et précédé d'un Abrégé de la Vie de Mahomet,' Paris, 1783, 2 vols. 8vo. This is the best translation of the Korán which the French possess. In 1784 Savary published the first volume of his 'Lettres sur l'Egypte.' The other two volumes were published in 1785, together with a new edition of the first volume, Paris, 3 vols. 8vo. Savary died at Paris, Feb. 4, 1788.

A few months after Savary's death, his 'Lettres sur la Grèce,' a work which he was engaged upon during his illness, were published at Paris, 8vo. Savary had composed while in Egypt a 'Grammaire de la Langue Arabe Vulgaire et Littérale,' which he had presented to the French government in 1784, but it was not published till 1813 (Paris, 4to.), and in the mean time the Arabic grammars of D'Herbin and Silvestre de Sacy had already appeared, of which that by De Sacy was much superior.

SAVE. [Austria.]

SAVENAY. [Loire Infe'rieure.]

SAVERDUN. [Arie'ge.]

SAVERNE. [Rhin, Bas.]

SAVIGLIANO. [Coni.]

SAVILE, SIR HENRY, was born at Over Bradley, near Halifax, in Yorkshire, Nov. 30, 1549. He was admitted a student of Merton College, Oxford, in 1561, where he proceeded to the degree of B.A., and was chosen fellow. He took the degree of M.A. in 1570, about which time his fondness for the mathematics induced him voluntarily to read public lectures in the University on Euclid, Ptolemæus, and other writers. He also served as proctor for two years. In 1578 he made a tour on the continent, and at his return he was chosen tutor in the Greek language to Queen Elizabeth. He was elected warden of Merton College in 1585, in which office he continued for thirty-six years. He was made provost of Eton College in 1596, and on the accession of King James he was knighted. He died at Eton College, Feb. 19, 1622. He was a munificent benefactor to the University of Oxford, in which, besides various other donations, he founded, in 1619, two professorships, one of geometry, the other of astronomy, which are still maintained. He left his library to the University, and it is now preserved in a separate room near the Bodleian Library. His fame principally rests on a magnificent edition of all the works of St. Chrysostom, which was published in 1613, in 8 vols. folio; and on his collection of our best historians, published in 1596, under the title of 'Rerum Anglicarum Scriptores post Bedam.' As a mathematician, he is known principally by his 'Lectures on the first book of Euclid's Elements,' published in 1621, but several MS. collections of his on the history of the sciences are preserved in his library at Oxford.

SAVILE, GEORGE, MARQUESS OF HALIFAX, was the son of Sir William Savile, a Yorkshire baronet, of ancient family. Being ambitious, and endowed with brilliant talents, he played an active part in the intriguing reigns of Charles II. and James II. In 1668 he was raised to the peerage, by the titles of Lord Savile of Eland and Viscount Halifax; he was created earl in 1679, and marquess in 1682. He died in 1695, and the title became extinct in 1700, by the death of his son.

The Marquess of Halifax was the chief of those politicians to whom the expressive name of Trimmers was given. His works are lively and elegant. The chief of them are—'The Character of a Trimmer,' 'Anatomy of an Equivalent,' 'Letter to a Dissenter,' 'Miscellanies,' and 'Maxims of State.'

SAVIN. [Juniperus.]

SAVINGS' BANKS are banks established to encourage habits of prudence in the poorer classes, who were previously without any places where they could safely and profitably deposit their savings.

In the year 1817 legislative provisions were made for the management of these institutions. Acts were passed (57 Geo. III. c. 105 and 130) for encouraging the establishment of banks for savings in Ireland and England respectively. By these Acts, the trustees and managers were prohibited from receiving any profit or advantage from the institutions, and were required to enrol the rules of their institutions at the sessions. A fund was established in the office for the reduction of the national debt in London, entitled, 'The Fund for the Banks for Savings,' and to this fund the trustees were bound to transmit the amount of all deposits that might be made with them when the sum amounted to 50*l.* or more. For the amount so invested the trustees received a debenture, carrying interest at the rate of threepence per centum per diem, or 4*l.* 11*s.* 3*d.* per centum per annum, payable half-yearly. The rate of interest then usually allowed to depositors was four per cent. In Ireland the depositors were restricted to the investment of 50*l.* in each year, and in England the same restriction was imposed, with a relaxation in favour of the first year of a person's depositing, when 100*l.* might be received. An Act was passed in 1824, which restricted the deposits to 50*l.* in the first year of the account being opened, and 30*l.* in each subsequent year, and when the whole should amount to 200*l.*, exclusive of interest, no further interest was to be allowed. Subscribers to one savings' bank were not allowed to make deposits in any other.

In 1828 a further Act was passed, entitled 'An Act to consolidate and amend the laws relating to Savings' Banks,' and it is under the provisions of this Act (9 Geo. IV. c. 92), and of 7 & 8 Vict. c. 83, that all savings' banks are at present conducted. It is provided by the 7 & 8 Vict. c. 83, s. 19, that two written or printed copies of all rules or alterations of rules of savings' banks, signed by two trustees, shall be submitted to the

barrister appointed under 9 Geo. IV. c. 92, for his certificate, and the said barrister must return one of such copies, when certified, to the trustees, and transmit the other to the commissioners for the reduction of the national debt.

The money deposited in savings' banks must be invested in the Bank of England, or of Ireland, in the names of the commissioners for the reduction of the national debt. Unless it is invested, the depositors have not the benefit of the government security; and are liable to be defrauded by the managers, which sometimes occurs. The receipts given to the trustees of savings' banks for money thus invested bear interest at the rate of 3*l.* 5*s.* per cent., and the interest paid to depositors must not exceed 3*l.* 0*s.* 10*d.* per cent. per annum, the difference being retained by the trustees to defray the expenses of the bank. The trustees are not allowed to receive deposits from any individuals whose previous deposits have amounted to 150*l.*, and when the balance due to any one depositor amounts with interest to 200*l.*, no further interest is to be allowed; and not more than 30*l.* can be deposited by one person in any one year. Trustees or treasurers of any charitable provident institution, or charitable donation or bequest for the maintenance, education, or benefit of the poor, may invest sums not exceeding 100*l.* per annum, and not exceeding 300*l.*, principal and interest included. Friendly societies, whose rules have been certified pursuant to acts of parliament relating thereto, may deposit the whole or any part of their fund.

On the 20th of November, 1848, the number of savings' banks in England and Wales was 481; the number of accounts open was 909,336; and the amount deposited was 25,371,176*l.* In Scotland the number of savings' banks was 40; the accounts open were 85,472; and the amount deposited was 1,080,190*l.* In Ireland the number of savings' banks was 61; the accounts open were 50,119; and the amount deposited was 1,358,062*l.* The total number of banks was 582; the total number of accounts open was 1,044,927; and the total amount deposited was 27,809,429*l.*

By the 3 Wm. IV. c. 14, the industrious classes are encouraged to purchase annuities, to commence at any deferred period which the purchaser may choose, the purchase money being paid either in one sum at the time of agreement, or by weekly, monthly, quarterly, or yearly instalments, as the purchaser may determine. The transactions under this Act are to be carried on through the medium of savings' banks, or by societies established for the purpose, and of which the rector or other minister of the parish, or a resident justice of the peace, shall be one of the trustees. The 7 & 8 Vict. c. 83, contains some fresh regulations as to these annuities, as well as to other matters that concern savings' banks. This Act extends to societies for purchasing annuities as well as to savings' banks, and to Great Britain and Ireland, Berwick-upon-Tweed, Guernsey, Jersey, and the Isle of Man. Rules framed in agreement with the statute have been issued by the commissioners for the reduction of the national debt.

Annuity tables, calculated under the direction of government, for every admissible period of age, and for every probable deferred term, may be had at the office of the commissioners for reducing the national debt, in the Old Jewry, London. Every information respecting, and forms of rules, &c., for the establishment, &c., of friendly societies, building societies, loan societies, savings' banks, and government annuity societies, may be obtained free of expense, on applying by letter, post-paid, directed to the barrister appointed to certify the rules of friendly societies.

The 5 & 6 Wm. IV. c. 57, passed in September, 1835, extended the provisions of the 9 Geo. IV. c. 92, and of 3 Wm. IV. c. 14, to savings' banks in Scotland, and enabled existing banks to conform to the said Acts by preparing and depositing their rules pursuant to these Acts.

Military or Regimental Savings' Banks were established by warrant dated October 11, 1843. The following is the amount of all sums deposited in them within the year ended March 31, 1844; of all sums withdrawn during the same period; and of the interest allowed upon such deposits; and also of the number of depositors on the 31st of March, 1844 :—

	£	*s.*	*d.*
Amount of sums deposited .	15,069	3	2
Amount of deposits withdrawn	316	11	$5\frac{1}{4}$
Amount of interest allowed .	96	10	$1\frac{3}{4}$
Balance due by the public .	14,849	1	$11\frac{1}{2}$

Number of depositors, 1890.

(*History of Savings' Banks*, by J. Tidd Pratt; *The Law relating to the Purchase of Government Annuities through Savings' Banks and Parochial Societies*, by the same author; *A Summary of Savings' Banks, &c.*, by the same author, 1846.)

SAVONA. [GENOA.]

SAVONAROLA, GIRO'LAMO, a Dominican monk, a native of Ferrara, made himself known by his eloquent preaching at Florence, where he was living in the convent of S. Marco, in the latter part of the 15th century. Florence was then under the administration of Lorenzo de' Medici, all Italy was quiet, and yet Savonarola startled his hearers by foretelling the approaching irruption of fierce foreign hosts, which would bring bloodshed and desolation over the land. He also inculcated democratic doctrines, and recommended a return to the former popular system of government, which had been interrupted by the ascendancy of the Medici. On the expulsion of Piero de' Medici, Lorenzo's son, in 1494, Savonarola acted a conspicuous part in the disturbances which followed. He became the leader of the democratic party, which was successful for a time. A general legislative council was formed of 830 citizens, and a vast hall was constructed for their meetings in the town palace. Savonarola's influence was now very great, being looked upon by his party as a kind of prophet and supreme judge. But the opposition were not idle; they represented Savonarola as an impostor, and they accused him of heresy at Rome. Pope Alexander VI. (Borgia) summoned him to appear before him, in default of which he excommunicated him. Savonarola, who had long been preaching against the corruptions of

the clergy, did not spare the head of the church, whom he styled a usurper. After a long contest, in the course of which Savonarola completely lost his credit with the populace, a party of his enemies entered his convent of San Marco, by force, and dragged him, with his disciple Domenico, and another monk, to prison. He was tried before a mixed lay and ecclesiastical commission appointed by Alexander VI. He was condemned to death, and he and his two associates were strangled, and their bodies thrown into the flames, May 23, 1498.

Savonarola left several works, both in Italian and in Latin, one of which, entitled 'Triumphus Crucis,' is a demonstration of the truths of Christianity. His sermons however, of which some remain, are the most remarkable of his productions.

SAVOY (*Savoia*), a division of the kingdom of Sardinia, extending from 45° 4′ to 46° 24′ N. lat., and from 5° 30′ to 7° 10′ E. long., is bounded E. by the Graian and Pennine Alps, which divide it from Piedmont and the Valais; N. by the lake of Geneva; W. by the Rhône, which divides it from France; and S. by an offset of the Cottian Alps, which, running westward from the group of Mont Cenis, divides the southernmost part of Savoy from the French province of Dauphiné. This offset ends at the valley of the Isère, which forms a natural opening on the south-west, between Savoy and France. North of the Isère a ridge runs in the direction of the Rhône, forming a natural barrier to Savoy on that side. This ridge has been cut through at Les Echelles, to make the high road from Chambéry to Lyon.

Savoy consists of vast mountains, including some of the highest points among the Alps, Mont Blanc, Mont Cenis, and Mont Iseran; and of several narrow valleys inclosed by offsets of the Alps. It is divided into three basins: the northern basin, the waters of which flow northwards into the lake of Geneva; the central basin, the waters of which flow by means of the Arve, the Fier, and the lake Bourget, westward into the Rhône; and the southern basin, which is drained by the Isère and its affluents. A great part of the country is rocky and barren, and many of the male inhabitants leave their homes in order to get a subsistence. Cattle and sheep constitute the chief wealth of the alpine districts. Savoy does not produce corn enough for its consumption. Wine is made in most parts, and some of it is very good. Silkworms are reared in the south-west of the division, and fruit-trees are abundant. The mineral wealth of the division is considerable. Lead and anthracite coal mines are worked in the province of Tarantasia, near Moutiers, not far from which there are also valuable salt mineral springs. In the province of Mariana there are important mines of iron, copper and lead. The country is rich in marble of different colours.

The people of Savoy have an old established reputation for honesty, loyalty, and bravery; they speak a mixed dialect of French and Italian.

Savoy is divided into two Administrative Divisions, Annecy and Chambéry; and these are subdivided into seven provinces, the area and population of which are as follows:—

Provinces.	Area in sq. miles.	Pop. in 1840.
Savoia Propria	633.8	148,864
Alta Savoia .	376.2	49,758
Chablese . .	356.3	54,686
Faussigny . .	785.8	101,792
Genevese . .	610.0	100,005
Moriana . .	798.1	62,344
Tarantasia . .	697.8	46,688
Total . .	4258.0	564,137

Savoia Propria occupies the most western part of the country; it is the most level and fertile part of Savoy, and is divided from France by the Rhône and its affluent the Guier. It is drained partly by the Isère, and partly by the Leisse and other streams that run westward into the lake of Bourget, which has an outlet into the Rhône. The lake of Bourget is 5 miles N.W. of Chambéry; it is 10 miles long and 3 miles wide, and the surface is 700 feet above the sea. On the eastern side of the lake is *Aix*, much frequented for its baths. The capital of Savoia Propria and of the whole of Savoy is CHAMBERY.

Alta Savoia, E. of Savoia Propria and Genevese, consists of the valley of the Arli, an affluent of the Isère, which flows from north to south. Its chief town is Conflans, a small place of about 1500 inhabitants, at the mouth of the Arli.

Chablese comprises the southern coast of the lake of Geneva and the numerous valleys which slope towards it. The Dranse, which rises in the mountains near the borders of the Valais, and enters the lake near Thonon, is the principal river of Chablese. Its chief town is Thonon, which stands in a fertile country, on an eminence commanding a fine view of the lake of Geneva, and has 4200 inhabitants. Near it are the remains of the convent of Ripaille, now converted into farm buildings.

Faussigny, between Chablese and Savoia Propria, consists of the long valley of the Arve, and includes Mont Blanc and the highest part of the Pennine Alps. The valley of Chamouny belongs to Faussigny, and also the romantic valley of the Giffre, the principal affluent of the Arve, with its fine cascades and bordering glaciers. The chief town is Bonneville, a small place of 1300 inhabitants, on the right bank of the Arve.

Genevese, N. of Savoia Propria, consists of the valleys of the Fier and the Usses, affluents of the Rhône, and of the basin of the lake of Annecy, the waters of which have their outlet in the Fier. The chief towns are ANNECY; and Rumilly, which has 4000 inhabitants.

Moriana, the most southern province, consists of the valley of the Arca, which has its source at the foot of Mont Cenis, and joins the Isère above Montmélian. The high road to Italy leads through the whole length of this province. The chief town, St.-Jean, situated on the left bank of the Arca, has a cathedral and 2500 inhabitants.

Tarantasia, between Moriana and Alta Savoia, consists of the long valley of the Isère, running from east to west, from its source at the foot of Mont Iseran (13,300 feet high) to the confluence

of the Arli. Tarantasia is, next to Faussigny, the most Alpine part of Savoy, and the most interesting to mountain tourists. *Moutiers*, the chief town, a small place with 2000 inhabitants, has salt-works and a school of mineralogy and metallurgy. *St.-Maurice*, on the road leading to Italy, by the Little St. Bernard, is a town of 3000 inhabitants, with a considerable trade in cattle. A project is now (1850) under the consideration of the Sardinian chambers, of making a tunnel through the Alps to connect the railroads of France and Italy.

SAVOY, HOUSE OF. [SARDINIAN STATES.]

SAW, an instrument for cutting timber or other hard substances, usually formed of a plate of steel with a notched or serrated edge. Saws were used by the ancient Egyptians: a specimen, found among the tombs of Thebes, is deposited in the British Museum. There is a picture among the remains discovered in the ruins of Herculaneum, representing the interior of a carpenter's work-shop, with two genii cutting a piece of wood with a frame-saw; and on an altar preserved in the Capitoline Museum at Rome there is a perfect representation of a bow-saw, exactly resembling, in the form of the frame, and the twisted cord for tightening it, those used by modern carpenters.

Saws are of various forms and sizes, according to the purposes to which they are to be applied. The *Cross-Cut Saw* is used for dividing logs transversely. The *Pit-Saw*, a long blade of steel with large teeth, and a transverse handle at each end, is used for sawing logs into planks or scantlings. The *Frame-Saw* is a blade from five to seven feet long, used in a similar manner to the pit-saw, but it causes less waste, because the blade, being stretched in a frame, may be made much thinner. The *Ripping-Saw*, *Half-Ripper*, *Hand-Saw*, and *Pannel-Saw*, are saws for the use of one person, the blades tapering in width from the handle. *Tenon-Saws*, *Sash-Saws*, *Dovetail-Saws*, &c., are made of very thin blades of steel, of equal width throughout their whole length, and stiffened with stout pieces of iron or brass fixed on their back edges. *Compass-Saws* and *Key-Hole Saws* are long narrow saws, tapering from about an inch to an eighth of an inch in width, used for making curved cuts. Small *Frame-Saws* and *Bow-Saws*, in which very thin narrow blades are tightly stretched, are occasionally used for cutting both wood and metal. Saws are made for cutting bone, iron, brass, and many other hard substances.

The very commonest kind of saws are made of iron-plates, hammer-hardened, and planished upon an anvil, to give them some degree of stiffness and elasticity. The more useful saws are made either of shear or cast steel. The steel, reduced to thin sheets, is cut into pieces of suitable size and shape. The edges are perfected by filing, and holding the flat sides of the plates against large grindstones, which process prepares them for the cutting of the teeth. This operation is usually performed by a die-cutter in a fly-press, the motion of the saw-plate being duly regulated, so that the teeth shall be uniform; the larger teeth being cut one at a time; and the smaller, two, three, or more at a time, according to circumstances. The wire edges left on the teeth by the cutting-out press are removed by filing, after which the plates undergo the processes of hardening and tempering. The next operation is planishing by hammers, to make them more even and equally elastic; after which the saws are ground on large grindstones. The plate is held against the circular face of the stone by an interposing board, against which the grinder presses with all his force, in order to grind it as evenly as possible. He stands on tip-toes, stretching over the stone, which revolves with great rapidity; his hands, arms, breast, and knees being all brought into action to produce the desired effect. As this grinding impairs the flatness and elasticity of the saw-plates, they are submitted to a second hammering by the planishers, and their elasticity is restored by heating them over a coke fire until they attain a faint straw-colour. The marks of the hammer are removed by again passing the saws lightly over a grindstone, after which the final polish is given by a fine hard stone, a glazing-wheel covered with buff-leather and emery, or a wooden wheel, called the *Hard-Head*. After being cleaned by women, the saws are handed to the *Setter*, who lays each alternate tooth over the edge of a small anvil, and strikes them so as to bend each uniformly into a slight deviation from the plane of the saw, and then, turning the saw-plate, he sets the remaining teeth in like manner, but in the opposite direction: sometimes peculiar tools are used for this setting. After being set, the saw is placed between two plates of lead, in a vice, and the teeth are sharpened with a triangular file. The size, form, and sharpness of the teeth, vary according to the purpose to which the saw is to be applied. The handles are then fixed on by nuts and screws, and the saws cleaned off, oiled, and packed in brown paper for sale.

Saws for cutting stone are without teeth, although they are sometimes slightly notched upon the cutting edge, that they may collect and retain the particles of sand that are conducted into the cut by a small current of water, and by the attrition of which the effect is mainly produced. The saw-plate is tightly stretched in a kind of rectangular frame, of which it forms the lower side; and the frame, being suspended by ropes, is moved backwards and forwards by one or two men.

SAW-MILL. Although saw-mills have not been very generally introduced till within a few years, they are by no means of recent origin. They were used in England in the 17th century, but not without great opposition. Many of the earlier saw-mills were driven by water, and those of North America are still generally worked by that power.

The earliest kind of sawing-machinery was, in its essential features, the same as that still used for sawing logs of timber into planks. In this machine the saws are stretched in a frame which slides up and down on vertical guides; the reciprocating motion being imparted to the frame by a crank upon an axle turned by a connection with the water-wheel or other prime mover. The log is supported on a carriage resting upon

rollers, and is made to advance a little at each stroke of the saws, which cut during their descent only. The saws are usually either six or eight in number. Attempts have been made to introduce sawing-machines with two sets of saws, one of which should cut upwards; but they do not appear to have succeeded. A similar effect is sometimes produced by connecting two machines with one axle; the cranks being so adjusted that one saw-frame descends while the other rises.

The balks of timber to be divided into planks, of which two are generally operated upon simultaneously, are supported by rollers, and secured at the ends by suitable fastenings to a long iron carriage. This carriage is so connected to the saw-frame by wheel and pinion work, that the carriage and balks of timber are propelled forward as fast as the wood is cut. In order to keep the balks of timber steady during the cut, their inner sides slide against polished steel plates fixed to the frame-work of the machine, against which they are pressed by rollers.

The loss of power occasioned by the reciprocating motion of a long saw, has led to the adoption of *Circular Saws*, which, by revolving constantly in one direction, require less power, and may be driven with far greater speed than reciprocating saws; while their continuous action not only expedites the operation of sawing, but also makes the motion of the machinery more uniform. Perhaps the most interesting kind of circular saw is that used for cutting logs of hard wood into veneers. Brunel, to whom England is indebted for many valuable improvements in this class of machinery, took out a patent in 1806 for a method of constructing very large circular saws, by attaching several pieces of steel-plate to a flanch of iron turned perfectly true. In this way saws have been made of as much as 18 feet diameter; but such large saws can only be used for cutting veneers or very thin boards, which will easily bend so as to pass the flanch of the saw, which is necessarily of considerable thickness. In the principal room for cutting veneers at the City Saw Mills, London, there are eight saws varying from 8 to 17 feet diameter, and revolving from 70 to 90 times in a minute. By the largest saws logs of mahogany 3 feet square can be cut up into unbroken sheets of veneer, at the rate of about 10 to an inch, and so beautifully smooth as to require scarcely any dressing.

For cutting thinner boards, the circular saw is usually mounted in a bench or table, under which the axle passes, and having a slit or opening through which the upper part of the saw projects. The piece of wood to be cut is laid on the smooth surface of the table, and pushed towards the saw by hand. Small circular saws, so mounted, are often moved by means of a treadle and crank, and by a variety of ingenious modifications may be applied to many useful purposes.

In the beautiful and ingenious block-machinery erected at Portsmouth by Brunel, circular saws are extensively applied. [BLOCK.]

Mr. Eastman, of the United States, patented some curious modifications of sawing machinery about 1824. He found that when a circular saw is propelled with great velocity, it will cut much more smoothly and easily if it have only a few teeth placed at equal distances round its circumference than if, as usual, its periphery be full of teeth. He made a saw which had four cutting instruments called section teeth, each consisting of two teeth resembling a hawk's bill in form. The saving of labour as compared with a common saw is estimated at full three-fourths, and it is stated that, when driven at a proper speed (which is from a thousand to twelve hundred revolutions per minute), it will cut nine or ten inches in depth into the hardest white oak timber with the greatest ease. Mr. Eastman contrived these saws for cutting up timber in an unusual way, not through the log, but from the circumference to the centre; so that the cuts form the radii of a circle, and the planks or boards produced are thicker at the outer than the inner edge. The boards cut by this machinery are much used for covering buildings.

SAXE, MARSHAL. *Maurice, Count of Saxony*, was the natural son of Augustus II., king of Poland and elector of Saxony, and of the Countess of Königsmarck, a Swedish lady of high rank. Maurice was born at Dresden, Oct. 19, 1696. In 1708, when only twelve years old, he entered the army of the allies, and was present at the sieges of Lille and Tournay, at the battle of Malplaquet, and at the taking of Stralsund. When he was only fifteen years of age his mother married him to the heiress of the counts of Loben, a German lady of about the same age.

When Prince Eugene was besieging Belgrade he was joined by Maurice, who, when the campaign was terminated, returned to Dresden, and after a short stay repaired to Paris (1720), where the regent conferred on him the title of Mareschal-de-Camp. On his return to Dresden to ask his father's permission to accept the dignity, he obtained a divorce, and separated himself from his wife.

In 1726 Maurice of Saxony set out for the north, and was elected Duke of Courland. He was opposed by the Czarina Catharina I., and after some resistance, the Russians forced him to flee, and he escaped to France with nothing but his diploma of election. In 1728, after the death of Catharina I., Anna, Duchess of Courland, who had always evinced a warm attachment for him, invited him to return, which he did, and there is little doubt that she would have made him her partner on the throne of the czars, to which she was elected in 1730, if she had not previously discovered his inconstancy. He then returned to Paris, and afterwards repaired to Dresden. His father, Augustus II., died in 1733. Maurice having distinguished himself, under the Duke of Berwick, in the war which then broke out between France and Austria, was appointed lieutenant-general at the peace in 1736. On the death of the Emperor Charles VI. in 1740, a general war broke out. Louis XV. sent an army into Bohemia under the Marshal of Belle-Isle, the left wing of which was confided to the Count of Saxony, who was charged with the investment of Prague (1741), which he took by assault in a few

days, and with equal rapidity the fortress of Egra. He was afterwards appointed to the command of the army of Bavaria, and was also employed in the defence of Alsace. When Maurice returned to Versailles, Louis bestowed on him the staff of a Marshal of France (March, 1743).

In 1744 Louis XV. entered Flanders with an army of 80,000 men, the left wing being under the command of Marshal Saxe, who in the following year was appointed general-in-chief of the army in that country, which had been meantime augmented to 100,000 men. On April 22, 1745, the campaign was opened by the siege of Tournay. The allies advanced to its support with 45,000 men, English, Hanoverians, and Dutch. Marshal Saxe was suffering under dropsy, and underwent the operation of tapping on the 18th. On May 11, he was attacked near the village of Fontenoy, where by his courage and perseverance he gained a complete victory. This was soon followed by the conquest of all Belgium. The conqueror of Fontenoy was presented by Louis XV. with the château of Chambord, and 100,000 francs of annual revenue arising from the estate.

In the campaign of 1747 Marshal Saxe took Lafeldt after a hard-fought battle (July 2), which he followed up by the conquest of Bergen-op-Zoom, and in 1748 by that of Maastricht. The allies now made overtures of peace, which was definitely settled at Aix-la-Chapelle in the same year.

Marshal Saxe survived about two years to enjoy the honours which were lavishly showered upon him. He died Nov. 30, 1750.

Marshal Saxe's work, 'Mes Rêveries,' was published in 1757, 5 vols. 4to. It is a work on military affairs, which is said to contain a good deal of valuable matter mixed up with many assertions which cannot be relied on. It was translated into English by Sir William Fawcett, 1757, 4to.

SAXE-ALTENBURG, a small duchy on the northern frontiers of the Thuringian Forest, consists of two principal divisions; the eastern along the banks of the Pleisse, and the western, which is traversed by the Saale. The two parts are separated by the intervening territory of Reuss. The duchy lies between 51° and 53° N. lat., and 11° and 13° E. long. The area is 487 square miles. The climate is mild and salubrious. The country is hilly, richly wooded, and fertile. The rivers, which are very inconsiderable, and all tributaries to the Elbe, are the Saale, Orla, Roda, Pleisse, Sprotta, and Gerstenberg. There are several large lakes, and also mineral springs, the most celebrated of which is that at Ronneburg. Agriculture and grazing are skilfully conducted. Sheep, horses, swine, wild-boars, and deer abound. There are but few minerals. There are iron-mines however in the vicinity of Ronnneburg, and the extensive peat-fields near Altenburg yield abundance of fuel. A fine porcelain earth is found in the neighbourhood of Altenburg, which supplies the porcelain manufactory at Gotha. Manufacturing industry is chiefly confined to woollen cloths, stockings, and wooden-wares. There are considerable tanneries at Altenburg, Kahla, Eisenberg, and Lukau. The articles of export are corn, cattle, wool, butter, and timber.

The duchy is divided into two circles:—Altenburg, population 82,993: Saal Eisenberg, population 46,663: total 129,659. Rather more than half the population are Wends (German Slavonians). The inhabitants profess the Protestant religion, the number of Roman Catholics being very small. The duchy contains 8 towns, 2 market-towns, and 458 villages. Jena is the common university of Altenburg and the other Saxon duchies. There is a gymnasium at Altenburg, a lyceum at Eisenberg, six town schools, besides several preparatory and Sunday schools, a seminary for schoolmasters, a school of design, another for arts and mechanics, and some scientific associations.

Altenburg, after numerous changes of masters, was formed into a separate principality in 1603. On the extinction of the house of Altenburg in 1672, the larger portion reverted to Ernest the Pious, duke of Gotha. From this period the principality of Altenburg was governed by the family of Saxe-Gotha, till it expired in the person of Frederic IV., in February, 1825; since which time it has been held by the ducal family of Hildburghausen. The only towns in this duchy with more than 4000 inhabitants are:—ALTENBURG; *Ronneberg*, a walled town, containing a ducal palace, two churches, and above 5000 inhabitants; and *Eisenberg*, which is situated on a considerable eminence. Eisenberg is surrounded with walls, has a palace, three churches, an observatory, a town-hall, a poor-house, and 4465 inhabitants.

SAXE-COBURG-GOTHA, a duchy in the southern part of Thuringia, is composed of two large and various smaller detached portions, which are surrounded by the territories of Prussia, Schwarzburg, Sonderhausen, Weimar, Electoral Hesse, Meiningen, and Bavaria. The principality of Coburg lies between 50° 8′ and 50° 23′ N. lat., and between 10° 49′ and 11° 14′ E. long., and that of Gotha between 50° 38′ and 51° 20′ N. lat., and between 10° 15′ and 11° 2′ E. long. The area of Coburg is 200 square miles; that of Gotha 594: making a total of 794 square miles. The country, though occasionally level, is on the whole of a mountainous character, being traversed by the Thuringian range. The rivers are tributaries of the Main, the Weser, and the Saale. The rivers of Coburg are the Itz, Steinach, Rodach, and Nasslach; those of Gotha, the Hörsel, Emse, Ruhl, Nessa, Unstrut, Gera, and Apfelstedt.

Agriculture is the principal occupation of the inhabitants. The forests yield timber, potash, and pitch. The rearing of live-stock is prosecuted with much activity. Iron is found near Friederichsstadt; there are also coals, sandstone, millstones, marble, alabaster, gypsum, lime, potters'-clay, porcelain-earth, and salt. There is considerable manufacturing industry in Gotha, but little in the other districts. Besides a fair amount of export trade, the duchy has a considerable transit trade, as the high road from Leipzig to Frankfort passes through it.

The population of Coburg in 1846 was 44,010;

of Gotha 103,185; total, 147,195, nearly all of whom were Protestants. There are 9 towns, 10 market-towns, and 429 villages. Saxe-Coburg participates in the joint proprietorship of the University of Jena, and has 4 gymnasia, 2 institutions for schoolmasters, 1 for commerce, 4 for design and mechanics, besides several hundreds of town, village, and Sunday schools.

Coburg formerly belonged to the counts of Henneberg, but came by marriage into the Ernestine branch of the house of Saxony. On the death of the elector John Frederick, this petty territory was contended for by many branches of the Saxon family; and it was not till 1825 that the existing arrangement was made, whereby, on the territorial division of the duchy of Gotha-Altenburg, Coburg resigned its possessions on the left bank of the Steinach in exchange for the principality of Gotha, with the exception of a few small districts: it also obtained Königsberg and Sonnefeld from Hildburghausen, and Kahlenberg and Gauerstadt from Meiningen.

Upon the defeat of the elector John Frederick in 1547, the electorate was transferred to the Albertine branch, and a territory in Southern Thuringia was parcelled out to John Frederic, of which Gotha became the chief town. His descendants ruled there till 1825, when, on the death of the last lineal descendant, the duchy of Gotha was divided among the dukes of Saxe-Meiningen, Hildburghausen, and Coburg, the last having as its share the principality of Gotha. The only towns with more than 5000 inhabitants are COBURG and GOTHA.

SAXE-MEININGEN-HILDBURGHAUSEN, a duchy composed of the ancient duchy of Meiningen, the principalities of Hildburghausen and Saalfeld, the districts Themar, Römhild, Kranichfeld, and Kamburg, with seven villages from Coburg, which (with the exception of the districts acquired from Gotha and Altenburg) form one compact territory, extending in a semicircle along the banks of the Werra, and skirted by the chain of the Thuringian Forest. It lies between 50° 13′ and 50° 58′ N. lat. and 9° 57′ and 11° 54′ E. long., and has an area of 968 square miles.

The surface is mountainous: the loftiest point is the Bletzberg, 2760 feet high. The valleys supply rich pasturage to numerous flocks and herds; they also contain many curious caverns, of which the most remarkable are the Zinselloch, the Griebisch, and the Altensteinerhöhe.

The principal rivers are the Werra, Saale, Itz, Rodach, Milz, and Steinach. There are mineral springs near Liebenstein and Salzungen, and salt springs near Friedrichshall and Neusulza. The productions are those of central Germany; the minerals are various and abundant. Agriculture and grazing are the chief employments. In some districts there are many furnaces, mills, and glass-houses. The ordinary manufactures are coarse linens, sail-cloth, woollens, and cottons; there are also distilleries, breweries, and tanyards. The wooden toys made in this duchy are largely sold in England.

Meiningen, besides its joint right in the University of Jena, has gymnasia at Meiningen and Hildburghausen.

The population of the duchy and its dependencies in 1846 was 160,515, of whom nearly all are Protestants. It contains 23 towns and 431 villages. The principal towns are the following:—*Meiningen*, the capital of the duchy, is situated in 50° 35′ N. lat., 10° 24′ E. long., in a pleasant valley on the banks of the Werra, which here divides into several arms. It is a well-built town, and contains the ducal palace, which is a large and handsome building, a town-hall, 4 churches, and a theatre. The population is about 600. *Eisfeld* has a population of 3000; *Hildburghausen*, 3500; *Pösneck*, 3500; *Saalfeld*, 4300; and *Sonneberg*, 3500.

The duchy of Saxe-Meiningen formerly constituted a part of the domains of the counts of Henneberg; but it was governed as a separate state, by the descendants of Ernest the Pious, duke of Gotha, from 1680 to 1825. On the extinction of the house of Saxe-Gotha-Altenburg, in 1826, Meiningen received a considerable accession of territory in the principalities of Hildburghausen and Saalfeld, and several smaller possessions, giving up at the same time Kahlenberg and Gauerstadt.

Hildburghausen was founded by Ernest, sixth son of Ernest the Pious, in whose family it continued till 1826, when, by a family compact among the junior ducal houses, the reigning duke Frederic exchanged it for the duchy of Altenburg. Since that period it has merged into the duchy of Meiningen, with the exception of a few districts which were ceded to Coburg.

SAXE-WEIMAR-EISENACH, a grand-duchy on the northern frontiers of the Thuringian Forest, consists of the two principalities of Weimar and Eisenach, which are separated by Saxe-Gotha, and of the insulated district of Neustadt, besides various detached portions. It extends from 50° 25′ to 51° 27′ N. lat. and 9° 53′ to 12° 18′ E. long. The area is 1414 square miles.

The soil is for the most part well adapted to agriculture. The principal rivers are—the Saale, Ilm, Elster Orla, Unstrut, and Gera, in Weimar; and the Werra, Hörsel, Nessa, Ulster, and Felda, in Eisenach; all tributaries of the Elbe and Weser. There are mineral springs near Berka and Ruhla.

The mineral and vegetable productions are similar to those in the other Saxon duchies. The rearing of cattle forms an important branch of industry. Manufactures have made little progress.

The population in 1846 was—Weimar, 175,596, Eisenach 81,977; total, 257,573, nearly all Protestants. There are 33 towns, the principal of which are WEIMAR, EISENACH, JENA, and *Apolda*, which has a population of 4500.

The founder of the house of Weimar was John Frederic of Saxony, who was born in 1570, and whose original patrimony has been considerably augmented by purchase and the extinction of some of the collateral branches. At the Congress of Vienna, Charles Augustus received an accession of territory with 77,000 subjects, and the dignity of grand duke, which gives him claim to the title of royal highness.

SAXE-WEIMAR, BERNHARD, DUKE OF, born at Weimar, Aug. 16, 1600, was the fourth of the seven sons of John, duke of Saxe-Weimar. All the important circumstances of his life are connected with the Thirty Years' War in Germany. After the battle of Prague, Nov. 3, 1620, Bernhard served in the army raised by the Margrave of Baden-Durlach for the purpose of assisting Frederick V., king of Bohemia and elector palatine, to support himself after the loss sustained in that disastrous affair. In 1623 he commanded a regiment of infantry in the army of Duke Christian of Brunswick; and in 1625, and again in 1627, he was placed at the head of a regiment of cavalry in the Danish army raised by Christian IV. in support of the Protestant union. After the alliance between Louis XIII. and Gustavus Adolphus, Jan. 13, 1631, he joined the latter. Bernhard distinguished himself at the siege of Würzburg, in forcing the passage of Oppenheim, and in the Palatinate, where he took Mannheim by stratagem, and forced the enemy from all his posts in that quarter. Gustavus afterwards appointed him to the command of an army designed for the conquest of Bavaria, but recalled him to assist him against Wallenstein, and shortly afterwards they fought together at the battle of Lützen, Nov. 16, 1632. When Gustavus fell, the Duke of Weimar took the command, and forced the enemy to retreat, and shortly afterwards drove the Imperial army out of Saxony. The Swedish army was afterwards divided into two parts by the Chancellor Oxenstierna, and placed under the command of Marshal Horn and Bernhard of Weimar. Bernhard besieged and took Ratisbon, which however was afterwards retaken by the Imperial army, July 29, 1634, and Bernhard and Horn were afterwards defeated at Nordlingen, Sept. 7, 1634, owing to the impatience of the Duke of Weimar to give battle without waiting for the arrival of reinforcements. On Oct. 6, 1635, Bernhard concluded a treaty of alliance and subsidy with the King of France. On March 3, 1638, he gained the great victory of Rheinfelden, and obtained possession of the fortress on the 22nd. He afterwards besieged Alt Breisach, then considered one of the strongest places in Europe, which capitulated Dec. 19, 1638. He died suddenly at Neuburg on the Rhine, of a pestilential fever, July 18, 1639.

SAX'IFRAGA, a genus of plants, the type of the natural order *Saxifragaceæ*.

The species are mostly inhabitants of alpine and subalpine regions of the colder and temperate parts of the northern hemisphere. They are most of them true rock plants, and send forth their roots between the crevices of rocks on which they grow, by which means they loosen fragments of the rock, and in this way their name applies to them much better than to their supposed influence over calculus in the human system. Many of these species are well known as ornamental plants in our gardens, for which their hardy habits and beautiful flowers well adapt them.

Saxifraga umbrosa, London Pride, or None-so-Pretty, was found by Tournefort on the hills of Spain, and is a native of Great Britain and Ireland. It is one of the most popular of garden flowers. *S. Gemu*, Kidney-Leaved Saxifrage, is found on mountains in the south of Ireland, and is considered by some botanists as only a variety of the former. *S. granulata*, Granulated Meadow Saxifrage, is abundant on gravelly soils in Great Britain. The roots of this species, forming as they do little granular masses, were at one time sold in the shops under the name of Saxifrage Seed. It was formerly used extensively in nephritic and urinary diseases. Several varieties of this pretty saxifrage are frequently found in gardens. *S. aizoon*, Aizoon or Marginated Saxifrage, is a native of alpine situations in Austria, Switzerland, and most countries of the continent of Europe. It is frequent in gardens, bearing flowers with cream-coloured petals and reddish dots, opening in June and July. It is perennial and perfectly hardy. *S. cotyledon*, Pyramidal Saxifrage, is a native of the mountains of Lapland, Norway, Iceland, Switzerland, and the Pyrenees. It is commonly cultivated, and is well known for the profusion of beautiful white flowers it produces, which appear early in the summer. *S. hypnoides*, Mossy Saxifrage, or Ladies' Cushion, is a frequent plant in mountainous situations of Great Britain, especially among limestone rocks. It is also found on the mountains of Norway and on the Pyrenees. It is frequently found in gardens, where it thrives on shady walls and amongst rock-work. *S. crassifolia*, Thick-Leaved Saxifrage, is said to have been first introduced into this country in 1765, by Dr. Solander. *S. sarmentosa*, Chinese Saxifrage, is remarkable for its trailing stems, which it spreads round like a young strawberry plant, which, taking root in the ground, produce young plants in great abundance.

SAXIFRAGA'CEÆ, a natural order of plants belonging to the apocarpous group of Polypetalous Exogens. It consists of shrubs and herbaceous plants with single alternate leaves without stipules.

They are for the most part mountain plants, chiefly remarkable for the delicacy and beauty of their flowers, which are usually white. They inhabit the mountainous districts of Europe and the northern parts of the world, and constitute the chief beauty of the vegetation in high alpine stations.

The whole order is represented by De Candolle as possessing astringent properties. The *Heuchera Americana* is remarkable for its powerful astringency, and is used in medicine under the name of the North American Alum Root. *Chrysoplenium* is reputed to possess both aperient and diuretic properties.

SAXO, with whose name is commonly found the addition of GRAMMATICUS, the Grammarian, or the Learned Man, was a Dane of the twelfth century, and the author of a history of that nation. It ends with the year 1186. It is written in Latin, in a somewhat florid style, and, for the later years, is a most authentic and valuable historical remain; but the earlier portions are supposed to be of less certain authority. There is an edition in folio, Paris, 1514, with the title 'Historia Regum Heroumque Danorum;' and

another by one of the Stephens's, with a prolegomena, in which what little is known concerning him is to be found.

The name of Saxo-Grammaticus is connected with English literature as being the author who first gives the history of King Hamlet.

SAXON ARCHITECTURE. [GOTHIC ARCHITECTURE.]

SAXON LANGUAGE and LITERATURE. The terms Saxon and Anglo-Saxon are popularly used to designate that dialect of our language which prevailed to the close of the twelfth century. But the use of these terms is comparatively modern, and the men who spoke this dialect always called it the English. Several of our MS. Chronicles begin thus:—'Britain Island is eight hundred miles long, and two hundred miles broad. And there are in the island five languages, Æ̃nglish, and Brit-Welsh, and Scottish, and Pightish, and Book-Latin,' &c. Still we may use these terms with some convenience, and (thus cautioned) without any danger of being misled.

The Anglo-Saxon, like the Latin and the Greek, often distinguished the cases of its noun, and the conjugations, numbers, and persons of its verb, by a change in the vowel of the final syllable; in the dialect which succeeded, and which has been called the Old English, all these vowels were confounded, and in our modern dialect they have, for the most part, been lost. Thus the Anglo-Saxon *ath* has *athas* in the nominative and accusative plural, and *athes* in the genitive singular; the Old English *oth* has *othes* not only for its genitive singular, but also for its nominative and accusative plural; and in our modern English these three cases are all represented by the monosyllable *oaths*. Again, in the Anglo-Saxon, *athe* was the dative singular, and *atha* the genitive plural; in the Old English, *othe* represented both dative singular and genitive plural; and our present dialect, having lost the final vowel, had no means left of distinguishing these cases from the nominative *oath*. The third person singular of *lufian* was *lufath*, and the first, second, and third persons plural *lufiath*; in the Old English, *loveth* represented both numbers, and *lov'th* is the third person singular in the *spoken* language of the present day.

We say 'spoken language,' because our *grammarians* make *eth* the ending of the third person singular. But in Somersetshire, west of the Parret, where the southern dialect still lingers, they uniformly say *he lov'th, he read'th, he zee'th, it rain'th*, &c. We have evidence, that in the sixteenth and seventeenth centuries this dialect was general throughout the south of England, and we find numerous traces of its peculiarities in the literature of that period. The same observation will apply to *est*, the inflexion of the second person singular, and to some other endings, which are still preserved entire in our grammars, though they have lost their vowel in the spoken language for the last two centuries.

Either of the changes above noticed must have brought with it a new language. When, in the twelfth century, the vowels of the final syllables were confounded, there was at the same time a confusion of case and number, of tense and person, —in short, of those grammatical forms to which language owes its precision and its clearness. A writer had to seek for new forms of expression before he could convey his meaning clearly. As he had lost the means of distinguishing several cases of his noun, he called in the prepositions to his aid, and to show more clearly the regimen of his sentence, was obliged to confine within very narrow limits the position of his verb—thus abandoning that freedom of transposition, which is almost as remarkable in the Anglo-Saxon as in the Greek and Latin. The confusion introduced into his conjugations and tenses, he sought to remedy by various devices, which have hitherto been very little investigated, and at last he had recourse to that general use of the auxiliary verbs, which is at present so marked a feature in the language. The new dialect which resulted from these changes kept its ground for nearly two centuries. It exhibits the most striking analogies with the contemporary dialects of Germany and the Netherlands, and the further changes which converted it into our modern English were rapidly working a like revolution in these sister-tongues, when the invention of printing doubled the influence of their written language, and thus preserved them from further corruption. Unfortunately, at the time of this discovery, the vowels of our final syllables had already given way; the inflexions of our noun were gradually reduced to the remnant which our grammars still recognise; our adjectives, singular and plural, definite and indefinite, were all confounded; the past tense of *ede* could no longer be distinguished from the participle in *ed*, and our modern English was the result,—a language, according to some critics, flexible yet precise, copious yet methodical, enriched from all languages, yet possessing a noble simplicity of structure; according to others, broken and inconsistent, vague and fluctuating, neither possessing a sufficiency of terms, nor provided with laws and analogies by which they can be invented.

The vulgar notion, that the Norman conquest produced a mixed language, a jargon composed half of English and half of French, is wholly at variance with the MS. literature of that period. It is not till we approach the latter half of the 14th century that we find those 'cart-loads' of French words poured into the language, of which Skinner complains. We agree with this writer, in charging upon Chaucer much of the mischief resulting from these importations, not that he first introduced them, but that his authority chiefly sanctioned them. The learned but pedantic writers of the Elizabethan æra, and, at a later period, Johnson, followed his example. They have 'enriched' our language with the spoils of the foreigner, till its vitality has been almost extinguished—till its native forms and analogies have grown so nearly obsolete as to be almost unavailable to the production of a new term, or to the modification of those which have been so lavishly poured into it.

A comparison of the Anglo-Saxon with the Maeso-Gothic will convince us that there were dialects at a very early period, and these dialects have now been acted upon by various influences

for nearly 2000 years, till they have at last arranged themselves into four great families—the Northern, the English, the Low-Dutch, and the High-Dutch. The *Sexe* came from the south-western corner of the Cimbric Chersonesus, and they were only separated by the Elbe from the Netherlands, or flat alluvial country, where the Low-Dutch was spoken. The Engle came from the eastern coast, and were separated from the Danish islands merely by a narrow arm of the sea. We might then expect that in the counties colonised by the Engle we should find many peculiarities of the Northern languages, and in the counties colonised by the Sexe much that reminded us of the Netherlandish or Low-Dutch. We believe the Northern and Southern dialects of our island have been at all times distinguished by such peculiarities, but so few early records have come down to us written in the pure dialect of our northern counties, that it is only by comparing them in the second or Old-English stage of their progress that we can form any just notion of their distinguishing features. Perhaps these are best seen in the conjugation of the verb. The following table shows how closely the inflexions which distinguish our northern dialect agree with those of a Swedish conjugation:—

	South Dialect.		*North Dialect.*		*Swedish.*	
Pres.,	Ich	hop-e	I	hop-es	jag	hopp-as
,,	thu	hop-est	thu	hop-es	du	hopp-as
,,	he	hop-eth	he	hop-es	han	hopp-as
,,	we	hop-eth	we	hop-es	vi	hopp-as
,,	ye	hop-eth	ye	hop-es	I	hopp-ens
,,	they	hop-eth	they	hop-es	de	hopp-as
Perf.,	thu	hoped-est	thu	hoped-es	du	hoppad-es
Imper.,		hop-eth ye		hop-es ye		
Infin.,		to hop-en		to hop-e		att hopp-as

The inflexions in *s* are generally used in the Northern languages with a passive meaning; and there are some traces of their having been used in our Northern dialect for the same purpose.

Another peculiarity of our Northern dialect is the frequent use of the substantival ending *er* (in which it again resembles the languages of Northern Europe), as *wulfer*, a wolf; *hunker*, a haunch; *teamer*, a team; *heather*, heath; &c.

In this dialect we have also a less frequent use of the articles, conjunctions, and personal pronouns. This is one of its most striking features. Every person who has been in the north of England must have heard such phrases as 'come out o house,' 'gang into field,' put'n in poke,' &c.

All these peculiarities of our Northern dialect may be traced to the Anglo-Saxon period; and there is little doubt that the most striking feature of the Southern dialect, namely, its preference of the vocal to the whisper letters, as *z* for *s*, and *v* for *f*, is equally ancient. It always prevailed in the Netherlandish dialects, and may be traced in the orthography of our Southern manuscripts to the beginning of the 13th century; but, as the Anglo-Saxons had neither a *v* nor a *z*, it is only by analogy we infer the existence of the corresponding sounds in their language. The argument however from analogy is so strong, that we may safely conclude either that the Anglo-Saxon *f*, *s*, were pronounced in our southern counties as *v*, *z*, or that, like the modern *s*, they represented both a whisper and a vocal sound; in other words, were pronounced sometimes as *f*, *s*, and sometimes as *v*, *z*.

This mixture of the written and the spoken language in our manuscripts, and the total extinction in many counties of our local dialects, render it extremely difficult to point out the limits within which our two great dialects were spoken. Layamon, whose language seems clearly to belong to the Southern dialect, is described in all the histories of our poetry as a native of South Gloucestershire; but the localities mentioned in his poem belong to the north of Worcestershire; and he was, beyond doubt, an inhabitant of Areley-Regis near Stourport in that county. If he used the dialect of the neighbourhood (and this must be assumed till the contrary be shown), the Southern dialect must have prevailed over the whole of Worcestershire, and the men of that shire must have been Sexe in origin, and not, as hitherto supposed, a colony of Engle. Perhaps a line drawn from the north of Essex to the north of Worcestershire would pretty accurately define the portions of the island respectively colonised by the Engle and the Sexe.

The origin of the Midland dialect may admit of the following explanation. During the heptarchy, Gloucestershire and Oxfordshire belonged to Mercia, and not to the kindred race of the West-Sexe; and when the Danes held possession of the north of England, the shires of Warwick and Northampton, and generally that of Leicester also, were united in the closest ties with the southern counties. This fellowship seems to have led, at a very early period, to the use of an intermediate dialect, which would be encouraged by the numbers that flocked from all parts to the universities. The 'Reve's Tale' is a specimen of the ridicule which attached to the forms of Northern speech, and the speech of the Southron was treated with as little ceremony in the north of England. ('Towneley Mysteries,' Secunda Pars.) Hence we may understand the progress made by the intermediate dialect, and are prepared for the conclusion, to which we are led by an examination of our Old-English manuscripts, no less than by the express declaration of a contemporary philologist. Higden, who lived in the 14th century, ranges our provincial dialects under three heads, the Northern, the Midland, and the Southern.

The Northern dialect was still broadly spoken, within the last three centuries, in the counties of Lincoln, Rutland, Derby, and Stafford; but it has been gradually giving way before a language so much more widely understood, till it is now found only in scattered localities in the mountains of the north of England or in the Lowlands of Scotland. The Southern dialect began to yield at a later period. It was certainly spoken at the beginning of the 17th century in all the counties round London.

The earliest specimens of the Anglo-Saxon literature, like that of most nations, are metrical. An Anglo-Saxon verse is made up of two sections, which together may contain four, five, six, or even more accented syllables. These sections are bound together by the law of alliteration, or, in other words, each verse must have at least two accented

syllables (one in each section) beginning with the same consonant or with vowels. Sometimes, and particularly in the longer verses, there are two such alliterative syllables in the first section, as in the verse

met | od for | thy *man* | e——*man* | cynne fram |

It is very incorrect to call this alliteration the 'essence' or the 'groundwork' of Anglo-Saxon verse. It is certainly an important part, but still a mere adjunct. The purposes it served were similar to those which are provided for by the final rhyme of our modern versification. The essence of Anglo-Saxon verse consisted in its system of rhythm. As the accents generally varied from four to six, it may be thought that the rhythm was too vague and loose, but in practice it is generally found sufficiently definite; and there are some of its rules which certainly give it a more scientific character than belongs to the system that has superseded it. For example, no sentence, nor any important member of a sentence, could end otherwise than at the close of a section. In our modern poets we often find a sentence ending in the midst of a section, or even immediately before the last syllable of the verse:

'His peers
Have found | him guil | ty—of high-trea | son. Much |
He spoke and learnedly for life,' &c.;

but such a verse would not have been tolerated in an Anglo-Saxon poem. We may indeed find scores of such verses in the printed editions of these poems; but not one single example, and we speak advisedly, in any Anglo-Saxon MS.

The 'Gleeman's Song'* is the oldest specimen extant of Anglo-Saxon literature. It is found in what is called the Exeter MS., one of the books left by Bishop Leofric to his cathedral, about the middle of the 11th century. Of the Gleeman himself we know nothing, save what can be learned from the poem, from which we infer that he lived in the latter part of the fourth and the beginning of the fifth century of our æra.

The 'Gleeman's Song,' like many other Anglo-Saxon poems, has a short preface in verse, which appears to be of almost equal antiquity with the poem. After the preface follows a list of celebrated kings, from which the Gleeman selects for special notice Alexandreas, who appears to be Alexander of Macedon, and Wala, who is, no doubt, the Wallia that founded the kingdom of the Visigoths at Toulouse, A.D. 417. With the exception of Alexander, all of them appear to have been the Gleeman's contemporaries. After this enumeration he proceeds—

'So I fared through many stranger-lands,
Through the wide earth; of good and evil
There I tasted; from family parted,
From kinsmen far, widely I did my suit—
Therefore may I sing, and story tell,
Relate fore the crowd, in mead-hall,
How me the high-born with largess blest.

I was with the Huns,' &c.

We have then the names of nations and of countries visited by him, which appear to be strung together in the order best suited to the alliteration. The whole concludes with a short eulogy on the dignity and privileges of his craft.

There are two other poems, which must have been composed before the Engle left the Continent, the 'Battle of Fins-burgh,'* and the 'Tale of Beowulf.'† The first of these is a mere fragment, and appears to have belonged to one of those historical songs which Tacitus ('Germ.,' 2) represents as the only literature of the ancient Germans. The other is chiefly taken up with the relation of two of Beowulf's adventures: the first against a monster called the Grendel; the second against a terrific 'worm,' or 'earthdrake.' The poem has come down to us in a modernised form, and the mixture of Christian and heathen notions is sometimes singularly curious. For the most part, the nature of the subject, and the marked change that takes place in the rhythm, enable us to lay our finger on the very line where the interpolation begins. The following is one of the attempts to reconcile the old superstitions and the new creed:

'The grim stranger was Grendel hight—
Mighty pacer of the March; who held the moors,
Fen, and fastness—land of the Fifel-kin.

The hapless man long had kept it,
Sithen his Maker him had doomed.
On Cain's kin the slaughter avenged
The eternal Lord,—for that he Abel slew;
Nor joyed he in that feud, but him out-drave
His Maker, for the sin, far from mankind.
Thence evil births all proceeded,
Ettyns, and Elves, and Orknees;
So too the Giants, that with God fought
A long throw—for it he paid them meed!'

Some of the oldest pieces of poetry, written after the removal of the Engle to this country, and now extant, are the songs of Cædmon‡. The circumstances which first called forth the talents of this poet are related by Bede, who must have known many of Cædmon's contemporaries. Only six of Cædmon's poems have reached us. The subject of the first is the Creation; that of the second, the Temptation and Fall, to which is added, rather inartificially, a narrative of the events recorded in Genesis, to the offering of Isaac; the third relates the Exodus; the fourth, the story of Daniel; and the Torments of the Damned, and Christ's Harrowing of Hell, followed by his Ascension and Glory, are the subjects of the other two. What remains of Cædmon's poems is equal in length to about one half of the 'Paradise Lost.'

Perhaps there never lived an individual who exerted a greater influence on our national modes of thought and expression; and on this ground alone, if on no other, he must rank with the greatest names of our literature. For six centuries he was the great model whom all imitated and none could equal, and fragments of his verses may be found in the verses of almost every succeeding poet. Among the early imitators of this great poet we should perhaps rank Aldhelm, bishop of Shireburn. His poems were still sung by the

* The text of this poem is at the end of Kemble's 'Beowulf' (1837), a text and translation in Conybeare's 'Illustration of Anglo-Saxon Poetry' (1826), and in Guest's 'History of English Rhythms' (1838).

* The text was published by Hickes from a MS. now lost.

† Text and translation by Thorkelin (1815), by Kemble (1837).

‡ Text published by Junius; text and translation by Thorpe.

people in the days of Malmesbury, but are now lost, or more probably lie unowned amid the heaps of devotional poetry which fill our Anglo-Saxon MSS.

We have called the 'Battle of Fins-burgh' an historical poem: another poem of the same class was written on the death of Byrthnoth*, who bravely fell in resisting one of the Danish inroads, A.D. 993. (Hume, 'Hist.,' i. 3.) Works, now lost, were written in the 11th century by Leofric, Hereward's chaplain, on the warriors of our early history; and the songs commemorative of Hereware's exploits, which Ingulf tells us were in his day so popular, were probably written by the same hand. There is little doubt also that many of the Old-English romances, as 'Horn,' 'Havelok,' 'Bevis of Southampton,' 'Guy of Warwick,' &c., are mere adaptations of Anglo-Saxon poems. Occasionally the subject was taken from foreign sources, of which the 'Tale of Judith†,' probably written in the 10th century, is a splendid example. The 'Tale of Appollonius of Tyre ‡' is in prose, and a mere translation from the Latin.

There are other songs preserved in our chronicles, and closely allied to those last mentioned, but they are much shorter, and partake more of the lyrical character. Among them are the Brunanburgh war-song§, Edgar's coronation song‖, the two songs which commemorate the death of this king‖, and the elegy written on the death of the Confessor ¶. The first and last of these are among the noblest specimens of Anglo-Saxon poetry.

A great deal of Anglo-Saxon verse was written during the 11th century. But the noblest relic of this period is the Psalter, published by the University of Oxford, from a MS. preserved in the 'Bibliothèque du Roi.' In the first part, each psalm has an Anglo-Saxon translation in prose; and also a preface, giving some account of its history, general scope, and tendency. The translation often paraphrases the Latin, so as to show more clearly its doctrinal or prophetical meaning: but after the 50th Psalm the translation is metrical, and though generally literal, exhibits many cases of glaring misconstruction. The prefaces also disappear, and the whole seems to be the work of a man very slenderly provided even with the rudiments of learning. This deficiency however may now be considered as amply compensated for by the high character of the poetry. Some of the psalms are translated with a terseness and also an elegance which place the translation far above any of our modern versions, and there is occasionally a Miltonic sweep of language that has not often been surpassed even in the choicest specimens of our sacred poetry.

Among the most important prose works of our Saxon literature must be ranked those extraordinary compilations which are commonly called (as if they constituted but one work) the 'Saxon Chronicle.' The earliest copy of a Saxon Chronicle now extant is the Plegmund Manuscript, in the library of Corpus Christi College, Cambridge. It is written, as Wanley observes, in the same hand to the year 891, and in hands equally ancient to the year 924. After that date it seems to have been continued and interpolated by various transcribers, whose notices of Christ Church, Canterbury, leave little doubt that the volume was once the property of that cathedral.

The next copy, in point of time, is the Dunstan MS. in the British Museum. This is also a Canterbury manuscript, and appears to have belonged to St. Austin's Abbey. It is written throughout in the same hand, and ends in the year 977. The noble ode on the battle of Brunanburgh would have remained for ever mutilated, and in parts unintelligible, but for the copy preserved in the Dunstan Chronicle.

Besides these two chronicles, we have a Worcester, an Abingdon, another Canterbury Chronicle, and a fourth, which appears to have been written at Peterborough. We have also transcripts and collations made by Lambarde, Junius, Josselyn, and other antiquaries of the 16th and 17th centuries, some of which were evidently taken from manuscript authorities no longer extant.

The Plegmund, the Dunstan, the Abingdon, and an ancient chronicle transcribed by Lambarde, all began with Cæsar's invasion. The Worcester, Peterborough, and latest Canterbury manuscripts begin with a description of Britain, extracted chiefly from Bede and Orosius.

The antiquaries of the 16th and 17th centuries seem to have assumed that the Anglo-Saxon monasteries kept a regular record of contemporary events; and there are certainly grounds for believing that registers of a certain kind were really kept by them. Bede's 'History' (iv. 14) has been referred to in proof of this. That there were also registers in which were recorded the accessions of the kings and other matters, we collect from the same venerable historian ('Hist.,' iii. 4). From details mentioned by Bede, and which could only have been supplied by written documents, it is clear that these historical notices reached to the times of paganism. With these materials at hand, we may readily understand the course followed in the compilation of our early chronicles. Who were the parties that continued and interpolated these chronicles is a question very difficult to answer satisfactorily. Archbishop Elfric, Saint Wulfstan, Hugh White the monk of Peterborough, and others have been named, with more or less of confidence, by different critics. For our own parts, we could never resist a feeling, almost amounting to conviction, that the character of William was the work of the venerable Wulfstan. It begins thus:—

'An. 1087.———If any wish to know what manner of man he was, or what state he held, or of how many lands he was lord, then will we of him write, as we him knew, we that have waited on him (the him onlocodon), and otherwhiles in his court have wonned,' &c.

* Text published by Thorpe, in his 'Analecta.'
† Text published by Thorpe, in his 'Analecta.'
‡ Text and translation by Thorpe (1834).
§ Text and translation by Price, in his edition of Warton's 'Hist.' i. 87; and by Guest, in the 'Hist. of Engl. Rhythms,' ii. 61.
‖ Text and translation in Ingram's edition of the 'Saxon Chronicle.'
¶ Text and translation in Ingram's 'Chronicle,' and in 'Hist. of Engl. Rhythms,' ii. 71.

There were few English churchmen at the close of William's reign who could put forth this claim to the confidence of their reader, and still fewer that could have drawn William's character with the freedom and at the same time with the Christian feeling that distinguishes this noble composition. Wulfstan was at that time the only English bishop; and when, after describing the cruelty and sternness of the king, he adds the prayer, 'may the Almighty God show to his soul mercy, and grant him of his sins forgiveness!' who does not feel that the moral qualities of the writer were as eminent as the opportunities enjoyed or the talents that improved them?

Among Anglo-Saxon prose writers we must not forget the name of Alfred. His chief works are translations from the Latin, and of these the most remarkable are his versions of Bede, Orosius*, and Boethius†. Certain verses of the last-named author he has also paraphrased in verse‡. Among what may be termed his original works, are his accounts of the voyages of the two Northmen Wulfstan and Othere, which were inserted in Hakluyt's collection.

Archbishop Wulfstan, better known by the name of Lupus, was a voluminous writer of homilies. He was translated from Worcester to York in 1002, and must be carefully distinguished from the Saint Wulfstan already mentioned. A still more celebrated divine was Elfric, the great champion who led the English church in its resistance to the Romish innovations of the 11th century. His authority was appealed to, and with powerful effect, by the friends of the Reformation. One of Archbishop Parker's works is entitled 'A Testimony of Antiquity, showing the Ancient Faith of the Church of England, &c., being a Sermon translated out of Latin into English by Ælfric, abbot of St. Alban's,' &c. It required all the exertions of the new theological school founded by Lanfranc and Anselm to keep under the principles so deeply sown by Elfric.

We close this notice of Saxon literature by observing that its influence upon the modern literature of the country has been much underrated. Without maintaining, as some authors have done, that Milton diligently studied Cædmon, we do not hesitate to assert that some favourite images, and even certain forms of expression, may be traced through our literature, century after century, from the pages of the Saxon *scop* to those of Spenser and of Shakspere.

SAXONS is the name of a branch of the German nation. The earliest writers who mention the Saxons describe them as neighbours of the Danes, south of the Cimbrian Chersonésus, or Jutland. Tacitus, though he speaks of the Angli and Varini, who must have been close neighbours of the Saxons, does not mention them. The Saxons at first occupied a great part of the country between the Elbe and the Cimbrian Chersonesus; but at last we find them occupying the country between the Elbe, the Rhine, the Lippe, and the German Ocean. This extensive tract of land is called by Anglo-Saxon writers Old Saxony, to distinguish it from New Saxony, or England.

In the third century the Saxons often landed on the coasts of England and France, and ravaged the maritime districts. About the middle of the fifth century (449) a large body of Saxons and Angles, led by Hengist and Horsa, sailed over to England, and established permanent settlements in this island. The Angles however seem to have prevailed in numbers or influence, for it was they that gave the name to their new country, Angelland, Anglia (England), though it was sometimes called Saxonia Transmarina. The name Anglo-Saxons, which comprises both Angles and Saxons, was invented by later historians. The history of the Saxons who settled in England, and with the Angles became the origin of a new population, henceforth forms part of the history of England. [ANGLES; ENGLAND.]

Those Saxons who remained in Germany conquered, about 530, conjointly with the Franks, the northern part of Thuringia as far as the river Unstrut, but soon after gave up the eastern part of their conquest to a Slavonic tribe. The southernmost of the Saxons, about 550, became tributary to the Franks. In proportion as the Saxons advanced towards the interior of Germany, and became better acquainted with agriculture and the breeding of cattle, they abandoned their former piratical mode of living, but remained nevertheless a warlike people.

Towards the close of the seventh century the Saxons were divided into three great tribes, the Ostfali on the western side of the Elbe, the Westfali in the country between the Rhine, Lippe, and Ems, and the Engeri in the centre, between the two former tribes, that is, on both banks of the Weser. The Franks under Charles Martel conquered some Saxon districts on the northern banks of the Lippe, and bloody wars were carried on against them by Charlemagne from 772 till 803. Many thousand Saxons fell in battle, and thousands were put to death because they refused to adopt Christianity. But they held out to the last, even after their chief Wittekind had submitted and become a Christian. The treaty of Selz on the Saale (803) terminated the war: the Saxons agreed to become Christians, and were put on a footing of equality with the Franks. Henceforth their history forms a part of that of the Carlovingian empire. To establish the new religion more firmly, Charlemagne founded seven bishoprics, and from the places he appointed as the seats for these ecclesiastical dignities, we may see the extent of country which the Saxons then occupied. The seats of the bishops were Osnabrück, Verden, Bremen, Paderborn, Minden, Hildesheim, and Münster.

SAXONY. Taken in its most extensive sense, the name of Saxony formerly designated a very large tract in Northern Germany, extending from the Weser on the west, to Poland on the east.

In a more limited sense, the Electorate and Duchy of Saxony gave origin to the minor Saxon houses, in 1462, when, by the death of Frederick the Mild, his dominions were divided between his two sons, Albert and Ernest, who were the

* Text and Transl. by Barrington (1772).
† Text and Transl. by Cardale (1829).
‡ Text and Transl. by Fox (1835).

founders of the Albertine and Ernestine lines, the former of which still reigns in the kingdom of Saxony, and the latter is divided into the four branches of Saxe-Altenburg, Coburg-Gotha, Meiningen, and Weimar. The Electors of Saxony continued for some generations to be subject to the Emperor of Germany. Saxony suffered severely in the wars with Charles XII. and in the Thirty Years' War. The peace of 1763 left the country burdened with an enormous debt, which made the government and the people sensible of the necessity of a total change in the political system, of reducing the military establishments, and endeavouring to lessen the burden of the public debt. In the war with France Saxony sided with the Allies till 1807, when the Elector was induced to enter into the views of Napoleon. He received large accessions of territory, and the title of Elector was changed into that of King; but the adherence of the king to the cause of Napoleon proved fatal to him in 1813. Saxony became the theatre of war; and in that year the battles of Lützen and Bautzen were fought, and were succeeded by the battles of Leipzig, and the retreat of Napoleon to the Rhine. By the treaty of Vienna, the King of Saxony was deprived of more than half his dominions in point of extent, and nearly half the population, or a territory of 7880 square miles, with 845,218 inhabtants.

Surface, Rivers, &c.—The river Elbe, traversing the kingdom from south-east to north-west, divides it into two unequal portions, between which a considerable difference exists in wealth and productive powers.

The eastern and smaller portion lies contiguous to the boundary of Bohemia. It contains a mountain region, the western declivity of which is intersected by numerous depressions, ravines, and valleys. It forms a picturesque spot, designated the Saxon Switzerland, and extends along the Elbe from Pirna to the Winterberg, and from six to eight miles from the river. It is in general a poor country, but the plain of Bautzen and some other parts are very fertile.

The western or larger portion of Saxony, which is situated west of the river Elbe, is naturally divided into three regions, the mountainous, the hilly, and the plain. The mountain-region lies within the Erzgebirge, extends over the northern slope of that range, and is bounded on the south by Bohemia. It has many summits from 2000 to 3000 feet high; and one, the Fichtelberg, is 3966 feet. The hilly region, which extends along the northern base of the mountains, reaches northward to a line drawn from Meissen on the Elbe westward to Döbeln, Kolditz on the Mulda, and Borna. The northern portion of Saxony west of the Elbe is a plain, and constitutes the most southern part of the great plain which extends to the shores of the Baltic. The plain is the most fertile portion of Saxony, though it contains several tracts covered with heath. Agriculture is the principal occupation of the inhabitants, but it is united to the rearing of cattle and horses. Sheep are numerous in the less fertile tracts. The climate is various, owing to the great difference of elevation in the surface.

The principal river is the Elbe, which is navigable for large river boats through the whole of its course, as far as it lies within the boundaries of Saxony. It is joined by the Black Elster, Röder, Freyberger, Zwickauer Mulda, and White Elster.

Productions and Commerce.—The vegetable kingdom yields corn, but not sufficient for the home consumption, potatoes, rape-seed, hops, flax, hemp, chicory, tobacco, madder, wood, saffron, medicinal herbs, anise, coriander, poppy, &c. Vegetables and fruit are very abundant. A considerable quantity of wine is made. Almost a fourth part of the country is covered with forests, consisting chiefly of pine and fir; other trees are less abundant.

The breed of cattle has been very much improved within the last century; but the most important animal is the Merino sheep, which has since 1765 yielded a supply of the finest wool. The horses are good; and there are swine, goats, and domestic poultry. Foxes, badgers, and hares are found in great abundance; lynxes and wild cats are rare; birds of prey are everywhere met with. There are also bustards, storks, heathcocks, pheasants, partridges, and wild geese, ducks, and swans.

The mineral riches consist of gold, copper, iron, lead, tin, cobalt, arsenic, vitriol, bismuth, nickel, zinc, antimony, quicksilver, calamine, rock crystal, various precious stones, potters'-earth, the finest porcelain clay in Europe, basalt, serpentine, granite, marble, alabaster, fluor spar, sandstone, limestone, slate, porphyry, black amber, brimstone, alum, saltpetre, and coals.

Next to England and the Netherlands, Saxony has, in proportion to its population, the most extensive manufactures in Europe. It produces damasks and other linens, lace of great beauty, woollen, cotton, and silk manufactures; and there are paper-mills, tanneries, breweries, distilleries, and foundries.

The centre of the commerce of the country is Leipzig. The inland trade is mostly conducted by the merchants of Leipzig, of which the book fairs are the most remarkable. The principal exports are—fine woollen manufactures to England, Spain, Turkey, and Russia; linen, lace, &c. to Italy, England, Spain, and France; thread, wool, worsted, smalts, porcelain, straw manufactures, wooden-wares, glass, fruit, timber, and mineral products. The imports are salt, cotton, silk, flax, hemp, colonial produce, salt and dried fish, fancy goods, &c. Saxony is one of the members of the Zollverein or German Customs' Union.

Religion, Education, &c.—There is no state religion: the great majority of the inhabitants are Lutherans, but the royal family having embraced the Roman Catholic faith in 1697, that religion was in consequence tolerated, and since the treaty of Posen, in 1811, the Lutheran and Romish religions are placed on an equal footing, and the professors of both enjoy the same rights. The number of Roman Catholics does not however much exceed 30,000.

Saxony holds a high rank with regard to the number and the excellence of its institutions for

education, and the general diffusion of knowledge, there being very few countries where the lower classes are so generally taught to read and write. The number of printing-offices and booksellers greatly exceeds that in any other country of equal extent. The educational establishments comprise the University of Leipzig, high schools at Grimma and Meissen, gymnasia, seminaries for schoolmasters, mining academy, institution for teaching the management of forests, military schools, deaf and dumb school, agricultural school, Sunday-schools, schools of industry, Roman Catholic schools, Academy of Arts at Dresden, besides free schools for the poor in all the principal towns, and numerous societies for the promotion of various branches of art and science in the chief cities.

The constitution is a limited monarchy with a representation divided into two chambers, without the consent of which no law can be enacted, altered, or authentically interpreted. The executive power is in the king.

The whole kingdom is divided into four circles, of which the population in 1846 was as follows:—

Dresden . . .	464,107	= 1,836,433
Leipzig	417,041	
Zwickau . . .	669,114	
Bautzen	286,171	

No country in Europe, except the Netherlands, is more densely populated. On an average there are 263 inhabitants to an English square mile. There are 141 cities and large towns, 51 smaller towns, and 3260 villages. The principal towns are—Dresden, Leipzig, Chemnitz, Freyberg, Plauen, Zittau, Bautzen, Meissen, Schneeberg, Annaberg, *Zwickau* [Erzgebirgische-Kreis], and several smaller towns.

SAXONY, PROVINCE OF, in the kingdom of Prussia, is situated between 50° 30′ and 53° N. lat., and between 9° 50′ and 13° 50′ E. long.; it is divided into the governments of Magdeburg, Merseburg, and Erfurt, and is composed of almost the whole of the portion of Saxony ceded to Prussia at the Congress of Vienna, to which the principalities lying to the north of the duchy of Anhalt and to the west of the Elbe and the Havel have been added; the whole forms an area of 9753 square miles, and had in 1846 a population of 1,742,452.

The principal river is the Elbe, into which flows the Havel and the Saale. The greater portion of the province belongs to the plain of northern Germany, and contains gentle eminences, but no mountains. The remaining portion is hilly, and has on the S.W. border the Brocken, which is the highest mountain (3500 feet) in northern Germany. The soil, which is generally fertile, supplies the population with the most important articles of food. The fine wool of the improved breed of sheep supplies not only the extensive woollen manufactures of the province, but furnishes a large overplus for exportation. The mineral products are chiefly copper, antimony, cobalt, and iron. The manufactures are woollens, leather, calico, and linen. There are several sugar-refineries, brandy-distilleries, tobacco manufactories, and porcelain works. The exports are wool, corn, woollen and cotton manufactures, brandy, copper, iron and steel wares, and salt. The principal towns are described under the three governments—Magdeburg, Merseburg, and Erfurt.

SAY, JEAN BAPTISTE, was born at Lyon in 1767, and died at Paris, Nov. 16, 1832. He came to the capital at an early period of the Revolution, and was one of the projectors and conductors of a journal entitled 'La Decade Philosophique.' After the 18th Brumaire, Say was called to the tribunate, but he ceased to be a member when it became the instrument of Napoleon. He also resigned an appointment which he held, and afterwards lived mostly in retirement.

The works of Say are the following:—'Traité d'Economie Politique,' published in 1802; 'Catechisme d'Economie Politique,' 1815. 'Lettres à M. Malthus sur différents Sujets d'Economie Politique,' 1820. 'Cours Complet d'Economie Politique Pratique,' 6 vols., 1829. The first and second works in the above list have been translated into English. Say is the author of some smaller works, one of which is entitled 'De l'Angleterre et des Anglais.'

SCABIO'SA (from *scabies*, the Latin word for scab or itch, which disorder the common sort is said to cure), a genus of plants belonging to the natural order *Dipsaceæ*. *S. succisa*, Devil's-Bit, is native of Europe to the Caucasus, and is very plentiful in Britain. In days of superstition it was fabled that the devil, envying the good this plant might do mankind, bit away part of the root. The root is astringent, and an infusion of it is bitter but not unpleasant. *S. Columbaria* is native of Europe, Caucasus, and Siberia, and is very common on chalky soil in Britain. *S. grandiflora* is native of Barbary, Italy, and Sicily, and is worth cultivation.

SCAE'VOLA. There were many distinguished Romans who bore this name.

P. Mucius Scaevola, one of a family of jurists, was tribúnus plebis B.C. 141, prætor B.C. 136, consul B.C. 133, and in 131 B.C. he was pontifex maximus. This Scaevola was a distinguished jurist, and also had the reputation of being an able orator and an honest man. Cicero speaks of his juristical writings, and Pomponius attributes ten works to him. Scaevola is cited in the 'Digest' several times. He was consul during the disturbances in which Tib. Gracchus perished, and his conduct was marked by moderation.

Q. Mucius Scaevola, commonly called the Augur, was consul with L. Cæcilius Metellus, B.C. 117. He is said to have been the son of P. Mucius Scaevola, or Q. Mucius Scaevola, as he is sometimes called, who was consul B.C. 174. He was less distinguished as an orator than for his knowledge of the Roman law (Jus Civile). He was Cicero's master when he was an old man, and after his death Cicero attached himself to Q. Mucius Scaevola, the pontifex. He was the son-in-law of C. Lælius, and the father-in-law of the orator L. Crassus, and is one of the speakers in Cicero's treatise 'De Oratore' (lib. i.), in the treatise 'De Amicitiâ,' and in the treatise 'De Republicâ.'

Q. Mucius Scaevola, called the Pontifex, to distinguish him from the Augur, was the son of Publius, who was consul in B.C. 133. He was the colleague of L. Crassus as tribunus plebis in B.C. 106, the year of Cicero's birth, curule ædile in B.C. 104, and consul in B.C. 95. As proconsul of the province Asia, he distinguished himself by the wisdom and justice of his administration. He subsequently attained the dignity of pontifex maximus. He was a man of strict integrity and great ability; a distinguished orator, and still more eminent as a jurist. (Cicero 'De Orat.,' i. 39.) The Pontifex formed many distinguished pupils, though he did not profess specially to give instruction in the law. C. Aquilius Gallus, one of the masters of Servius Sulpicius, was a pupil of this Scaevola. He perished in the consulship of the younger Marius, B. C. 82, being among those who were proscribed by him. The Pontifex was murdered in the temple of Vesta, where he had taken refuge, and the altar of the goddess was stained with his blood.

This Scaevola was the first Roman who attempted to systematise the Jus Civile, which he did in a work in eighteen books. It is cited in the 'Digest,' where the name of Mucius is often mentioned; but there are no extracts from it.

Q. Cervidius Scaevola, a Roman jurist, probably gave responsa in the time of Antoninus Pius; but he was certainly employed by Marcus Antoninus as a legal adviser. Septimius Severus, afterwards emperor, and Papinian, were pupils of Cervidius, who probably died in the reign of Severus. His responsa were often very brief, expressed in a single word ('Dig.' 17, tit. 1, s. 62); but the facts on which the opinion is given are clearly stated. His style has been blamed as obscure; but there is evidence of his great capacity, and he left a name behind him. There are 307 excerpts from Cervidius Scaevola in the 'Digest.'

SCAFFOLDING, a temporary erection of timber, usually for the purpose of supporting workmen and materials during the progress of a building. In ordinary buildings the scaffolding requires very little notice. Poles are erected in a vertical position a few feet from the walls, their lower ends being inserted in the ground. Wherever a platform is required for the workmen, a horizontal pole is tied to the uprights, parallel with the wall; and from this horizontal pole cross-pieces extend to the wall, into which their ends are received, to support a flooring of planks. As the building rises, the scaffold is strengthened by diagonal poles; and the several poles are fastened by ropes.

In the erection of important buildings of stone, a very convenient kind of scaffold has been recently adopted, consisting of large squared timbers well framed together, and terminating at the top in horizontal beams. Such a framing is erected on each side of the wall, unconnected with it, and rails are laid on the top beams, on which runs a carriage, capable of being moved by means of a winch-handle connected with the wheels. The carriage itself consists of a frame supporting another railway at right angles with that on which it runs; and on the upper railway is a smaller carriage, which supports tackle suitable for raising the stones. By this arrangement a stone may be lifted up, and moved, by the combined action of the two railways, to any point required on the wall.

The Centering of Arches is a peculiar kind of scaffolding; it is the wooden support or mould on which the arch rests while building. A centering usually consists of a number of distinct frames, resembling the trusses of a roof, placed equidistant from each other in vertical planes, and covered with a series of planks or beams of timber called bridging-joists, laid at right angles with the frames or trusses. This boarding or covering of bridgings forms a convexity coinciding with the internal concavity of the intended arch. For small arches the centering is usually covered with planks; but in large works bridging-joists, one laid for each course of arch-stones, are preferred, these being kept at the proper distance apart by blocks placed between them. The whold structure is stiffened by crossbars to keep the trusses equidistant and parallel to each other.

Much ingenuity has been applied in the construction of scaffolding for peculiar and unusual purposes, as the erection or repair of domes, columns, obelisks, &c. Mr. Hughes has invented a scaffolding, which he used for repairing the interior of a dome at Manchester. It consists of a vertical pole erected in the centre of the dome, to which is connected a framework, supporting a kind of ladder, corresponding with the form of the interior of the dome, and mounted on wheels, so that it may be moved round to any part of it, the vertical pole serving as an axis. Mr. Slacks, a mason, has invented a scaffolding for building an obelisk without scaffolding of the ordinary description. This simple and ingenious machinery was used in erecting an obelisk of sandstone, 100 feet high, not including the foundation, on the summit of a mountain called Whitaw, in Dumfriesshire, in honour of the late Major-General Sir John Malcolm. The Society of Arts rewarded the inventor with their gold Isis medal in 1837.

The finest scaffolding ever invented, perhaps, is that which now (1850) surmounts the Victoria tower at the New Houses of Parliament. It is made to travel upwards as the work progresses; and it revolves on a central axis, so that four extended arms of scaffolding may be brought over every part of the tower in turn.

SCAGLIO'LA (from the Italian *scaglia*, a scale or shell) is an incrustation of artificial composition which is applied to columns, and produces the most perfect imitation of marble, from which it can hardly be distinguished either by the eye or the touch, as it takes an equally high polish and feels equally hard and cold. Scagliola has long been in use in Italy, where, according to Lanzi, it was invented by Guido Fassi of Carpi (1584-1649), and where it was afterwards much used for Florentine or inlay-work of the kind called *a commesso*. It was not introduced into this country before the latter half of the last century, and the earliest application of it was in the columns of the Pantheon, in Oxford-street, London, built by James Wyatt. The composition or cement itself

is prepared from the purest gypsum, which is first broken into small pieces, and after being calcined is reduced to powder. It is then passed through a fine sieve, and mixed with Flanders glue, isinglass, &c. In this state it is mixed up with colouring matter of the hue required.

SCALA, DELLA, or SCALI'GERI. Can Francesco della Scala, called Can Grande (the Great), was the most illustrious of a family which acquired sovereign power at Verona. When Henry of Luxembourg came to Italy in 1311 to be crowned Emperor, Can Francesco joined him, and became the acknowledged head of the Ghibeline party in Lombardy, like his contemporary Castruccio Castracani in Tuscany. The dominion of Can Grande extended over Verona, Vicenza, Feltre, Belluno, Este, Monselice, Cremona, and lastly, after a war which lasted several years, also over Padua; in short, over almost the whole extent of country which has been since called the Venetian Territory. Dante in his exile found an asylum at the court of Della Scala, and both he and Boccaccio have praised him in their writings. Can Francesco died July, 1320, at the age of 39, having been ruler of Verona for about nineteen years. His descendants continued to rule till 1387, when Gian Galeazzo Visconti, duke of Milan, took possession of Verona. After some more vicissitudes Verona came into the possession of the Venetians, in the year 1409.

SCALD. [Burns and Scalds.]

SCALD, properly written *Skalld*, is an ancient Scandinavian word which signifies poet. The Scalds were not merely poets, but also the historians of their nation. Their poetry is almost the only source whence we derive our knowledge of the ancient history of the North of Europe. We still possess a very long list of Scalds, among whom are persons of the highest rank, and even kings. The most distinguished were those of Iceland. See 'Fundgruben des Nordens,' vol. i.; John Olafsen, 'Om Nordens gamle Digtekonst, Grundregler, Versarter, Sprog og Fóredrags mode,' Copenhagen, 1786; F. Wachter, in the introduction to his German translation of Snorro Sturleson's 'Heimskringla.'

SCALE (Mathematics). A scale is any line drawn upon wood or other solid substance, and divided into parts, equal or unequal, the lengths of which may be taken off by the compasses, and transferred to paper, in aid of any geometrical construction. The manner in which the scale is divided depends of course upon the nature of the algebraical or trigonometrical expression the values of which are to be represented.

SCALE (Music). The object of music being to please the ear, or the mind through the ear, there is no other test of excellence nor criterion of fitness, in any one detail, except the opinion of the best judges. The mathematical considerations employed in an article like the present are not to be considered as placing the musical scale upon a mathematical basis, but simply as showing that there is something like an explanation of rules which derive their authority not from the mathematical system which embodies them, but from the sanction of the majority of cultivated ears.

The sounds which are agreeable to the ear are found to be those which are the consequence of vibrations of equal duration following one another. The note called A, for instance, sounded at the same time on a harp, a flute, and a horn, presents three different characters, three different intensities, but only one species of vibration as to the time of lasting. If the first instrument communicate 430 vibrations in a second to the air, so does the second instrument, and also the third. With the difference of intensity or loudness, and with the difference of character, the twang of the harp, or the tone of the horn, we have nothing to do in considering the place in the scale of the note they sound: a cultivated ear discovers that they sound the same note, and a mathematician knows that they severally communicate to the air the same number of vibrations per second.

Let us then suppose a string to be mounted and stretched at both ends, or, better still perhaps, suspended vertically by one end, and bearing a weight at the other. If this string be then set in vibration by the finger or by the bow of a violin, a musical (that is, a pleasant) sound is produced, if the string be not too long, nor stretched by too small a weight. With the phenomena of vibration, as connected with the length, material, and stretching weight of the string, we have here nothing to do except to remark—1, That the ear observes that, material and tension remaining the same, the longer the string the lower the tone, and vice versâ; 2, That the mathematician knows that, ceteris paribus, the longer the string the fewer the number of vibrations in a given time, in inverse proportion to the length. Thus, if a certain string, stretched by a certain weight, give 100 vibrations per second, a string of half the length, stretched by the same weight, will give 200 vibrations per second. If a vibration mean a double motion of the string, once backwards and once forwards, the effects begin to be musical soon after the string is short enough, or stretched enough, to give 30 vibrations per second.

The number of musical tones is, theoretically, infinite: that is, between any two tones as many different tones as we please can be interposed, no one of which is so high as the higher, nor so low as the lower.

Taking such a string or monochord (single string) as above described, it is immediately found that any alteration of its length produces some alteration of the tone. If the change be very slight, a dull or unpractised ear may not readily perceive it; but let the alteration be carried a little further, and there can be no difficulty. Such tones, near to one another, when sounded together, have a disagreeable jarring effect, accompanied by beats; but when the second string has been considerably shortened (say that this is done gradually), the disagreeable effect ceases almost at once, and at the moment when the shortened string is to the longer one as five to six. Two sounds are then heard which harmonise together, and on their joint effect the ear dwells with pleasure until it becomes monotonous (this very common word is itself derived, as to its common signification here used, from the wearying effect of the

same tone, or set of tones, long continued). In the meanwhile, and during the shortening of the string, the joint effect, though always disagreeable, is not equally so throughout; and there is one place in particular where the effect, though not agreeable to the beginner, is bearable for a little while, and highly agreeable to the practised ear, which knows that full compensation is at hand in what is called the resolution of the discord, or transition to a more harmonious combination in a manner which seems peculiarly natural. This intermediate and more tolerable phase of sound takes place when the shortened string is to the other as eight to nine. Moreover, it may be observed that this last combination, hardly bearable, is rendered perfectly so if the two tones, instead of being sounded together, are made to follow each other in succession, no matter how rapidly. In both these cases the student will observe that the proportion of the lengths of the strings is that of some small numbers, five to six, and eight to nine. And it is matter of experiment, that the more simple the proportions of the lengths of two strings (stretched by the same weight), the more useful the combination in music.

Instead of speaking of the lengths of the strings, we may pass to the relative numbers of vibrations in a second, which are inversely as the lengths. Thus, two strings of ten and eight feet, stretched by the same weight, vibrate so that the one of ten feet makes eight vibrations, while that of eight feet makes ten.

We now proceed to consider the most simple combinations; and first, that of two to one. Let the second string be half the first, or make two vibrations while the first makes one: there is then not only a joint effect which is agreeable, but a peculiar sameness of the two notes, insomuch that two instruments, made to play together in such manner that the notes of the second shall always be of twice as many vibrations as the simultaneous notes of the first, would be universally admitted to be playing the same air, with no more difference than of that sort which is heard when a man and a boy attempt to sing the same air together. This perfect sameness, for so it will be called, though the two instruments never sound the same tone together, admits of no explanation; for though the ratio of the simultaneous vibrations is the simplest possible (two to one), there is no perceptible reason why, because simple ratios generally give harmonious combinations, the most simple of all should produce an absolute feeling of identity of character in the two tones. To this circumstance however we owe the most material simplification of the musical scale; for let it be settled, for instance, what strings give agreeable notes between those of 20 and 10 feet long, and division by two will give all the strings which can be admitted between those of 10 and 5 feet; thus, if it be proper to admit a string of 8 feet in the former set, one of 4 feet must also take its place in the latter.

Again, it is observed that the relative effect of two tones is always the same as those of other two, when the numbers of vibrations made in a given time in the first pair are in the same proportion as the corresponding numbers in the second pair. Thus, suppose that in a given time the numbers of vibrations made by four strings are 12, 18, 40, and 60. Then,

$$12 : 18 :: 40 : 60, \text{ or } \tfrac{18}{12} = \tfrac{60}{40},$$

and we may say that, according as the first and second sounded together are pleasant or unpleasant, so are the third and fourth; also, if an air beginning on the first string require an immediate transition to the second, then the same air begun on the third string will require an immediate transition to the fourth.

A *Musical Interval*, then, is given when the fraction which expresses the proportion of the vibrations of its two notes in a given time is given. By the interval $\frac{3}{2}$ we mean that of two notes, the higher of which makes three vibrations while the lower makes two. Thus, if 18, 23, and 30 be the numbers of vibrations made by three strings in the same time, and we wish to find a fourth note which is as much above the third as the second is above the first, we must not make a string of 35 vibrations in the same time (as the beginner might do), that is, not one of $30 + 23 - 18$, but one of $30 \times \frac{23}{18}$, or $38\frac{1}{3}$ vibrations in the same time.

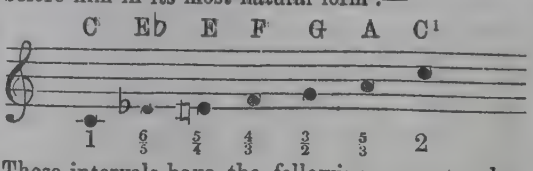
Let us now take a string, and call the note sounded by it C, and let the string of twice as many vibrations (or half its length) have the same name, with a difference (for the reason above given); call it C^1. Let us now seek for the simplest fractions which lie between 1 and 2. Take the numbers up to 6 (the ear does not so well agree with 7 and all higher prime numbers, why, of course cannot be told, but simplicity must end somewhere, and, by the constitution of the ear, ratios in which 7 and higher primes occur are not agreeable), and form every fraction out of them which lies between 1 and 2; we have then

$$\tfrac{3}{2},\ \tfrac{4}{3},\ \tfrac{5}{3},\ \tfrac{5}{4}\ (\tfrac{6}{4} = \tfrac{3}{2}),\ \tfrac{6}{5}.$$

Put these down, with 1 and 2, in order of magnitude, and we have

$$1 \quad \tfrac{6}{5} \quad \tfrac{5}{4} \quad \tfrac{4}{3} \quad \tfrac{3}{2} \quad \tfrac{5}{3} \quad 2$$

Take such a set of strings that, while the first makes one vibration, the second makes $\frac{6}{5}$ of a vibration, the third $\frac{5}{4}$ of a vibration, and so on up to the last, which makes 2 vibrations: or take a set of strings equally stretched, of which the length of the first being 1, that of the second is $\frac{5}{6}$, &c., and of the last $\frac{1}{2}$. Every one of the notes thus produced will be agreeable when sounded with the first, and if the first sound C, the musician will have the following part of the scale before him in its most natural form:—



These intervals have the following names; why, will presently be seen,—

$\frac{6}{5}$ minor third.	$\frac{3}{2}$ fifth.
$\frac{5}{4}$ major third.	$\frac{5}{3}$ major sixth.
$\frac{4}{3}$ fourth.	2 octave or eighth.

We have not yet, however, got a sufficiently agreeable scale, and the reasons why the ear will not be contented with the preceding most simple concords, must be derived from observation, from which it appears—

1. That a frequent repetition of sounds very near to one another is not pleasing to the uncultivated ear. Now the interval from the minor to the major third is as follows: the first makes $\frac{6}{5}$ of a vibration while the second makes $\frac{5}{4}$, or the first makes 1 vibration while the second makes $\frac{5}{4} \times \frac{6}{5}$, or $\frac{25}{24}$. This is much too near to a unison for continual repetition.

2. That a frequent repetition of sounds too far from each other is not pleasing to the ear, after a little cultivation. If we look at the intervals from the fourth to the fifth, and from the fifth to the sixth, we find $\frac{9}{8}$ and $\frac{10}{9}$ for their representatives, while from the fundamental note to the minor third, and also from the sixth to the octave, the interval is $\frac{6}{5}$, much larger than the preceding intervals.

Both these defects, as must easily be seen arithmetically, and as the ear finds out for itself, may be remedied by inserting a note between C and E in place of E♭, which shall make a better division of the interval C E, and by placing an additional note between A and C¹. But how are we to choose these additional notes? If we cannot have any more very simple consonances with the fundamental note, we must take those tones which make the simplest consonances with other notes, and the more they make the better. We have already a repetition of some consonances; for instance,

Interval F C¹ is $2 \div \frac{4}{3} = \frac{3}{2}$, or a fifth.
Interval G C¹ is $2 \div \frac{3}{2} = \frac{4}{3}$, or a fourth.
Interval F A is $\frac{5}{3} \div \frac{4}{3} = \frac{5}{4}$, or a major third.

Now since $\frac{9}{8} \times \frac{4}{3} = \frac{3}{2}$, we see that a note $\frac{9}{8}$, or one which makes 9 vibrations while the fundamental note C makes 8, will be a fourth below G, and $\frac{9}{8}$ divides C and E well, the three notes 1, $\frac{9}{8}$, $\frac{5}{4}$, giving the intervals $\frac{9}{8}$, $\frac{10}{9}$, already found in another part of the scale. This note is D. Again, observe the interval from E to F, or $\frac{16}{15}$, and take a fifth above E, or $\frac{5}{4} \times \frac{3}{2}$ or $\frac{15}{8}$: this fraction falls between $\frac{5}{3}$ and 2, and looking at the intervals of $\frac{5}{3}$, $\frac{15}{8}$, and 2, we find $\frac{9}{8}$ and $\frac{16}{15}$, both of them intervals already found. This note $\frac{15}{8}$, or which makes 15 vibrations while the fundamental note makes 8, is B, and the usual scale of civilised nations, called the *Diatonic Scale*, is now complete in the following—

C	D	E	F	G	A	B	C¹
1	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{15}{8}$	2

This diatonic scale seems then to be the scale of the simplest concords of the fundamental note, with one alteration on account of the too great proximity of two concordant notes, and one interpolation on account of the too great distance of two others.

We shall now proceed to mention two varieties of it. It seems to have been offensive to the ears of rude nations to hear any semitones at all. If we deprive the diatonic scale of F and B, the notes which rise semitones at the next step, we have C, D, E, G, A, C, for all the sounds which remain in the octave. This unfinished scale, as we should call it, is the original scale of the Chinese, Avans, Hindoos, and Eastern Islands, the northern nations of Europe, &c. It is the well-known scale of the old Scotch and Irish music; it is said to have been found in Wales and Cornwall, in various parts of Africa, and even in old Italian music. The Chinese, who never change, have preserved it in absolute perfection, though the modern form of most ancient airs in other countries has been relaxed. We copy the notes of a Chinese air given by Laborde:

D C C G A G G C C A G E D C C G A G A A C E
C A G G C C A G E C C E D A C.

It will be observed that F and B never occur. An almost perfect specimen of this scale occurs in the Scotch air 'The Campbells are Coming.' The effect of the scale may be tried by playing *ad libitum* on the black keys of a pianoforte.

The other scale which we have here to mention is that known by the name of the *Minor Scale*, the common diatonic scale being called the *Major Scale*. It may easily be observed that the intervals of the minor third and minor sixth have a sad or at least plaintive effect, as compared with the major third and major sixth. No explanation can be given of this: perhaps the effect of musical intervals is governed in some degree by associations derived from the human voice in speaking. All persons, except perhaps schoolboys reading what they do not understand nor care about, are constantly, whether they know it or not, varying the tone in which they speak, and making intervals which are very nearly musically correct: and the effect of sorrow, regret, fatigue, &c., is to make those intervals minor. Any person of a quick musical ear who will watch the method of saying the simple words 'I cannot,' pronounced as a determination of the will, and compare it with the same when it is an expression of regret for want of power, will almost always find such an interval as C F or C¹ G in the first, and C E♭ or C¹ A in the second. If this be so, it is not surprising that a scale in which minor intervals occupy conspicuous places, which in the other scale are occupied by major intervals, should produce those associations which have been alluded to. This is a conjecture merely, for after all nature will take the liberty, in art as in science, of concealing her operations. But this much is certain, first, that the minor scale is more plaintive than the major, and secondly, that all musical composers are acquainted with the fact, from the African women who sung of Mungo Park, 'Let us pity the white man; no mother has he to bring him milk, no wife to grind his corn;' up to the composer of Der Freischütz, with all the power of cultivation and the memory of centuries of art. The change from the minor to the major scale is perhaps the most effective of musical resources, certainly the most powerful of those which are easily understood by ears of the ordinary degree of cultivation. Take as an instance the music of the following words from Oberon:—

Oh-Araby,-blest-Araby, my own, my native-land,
Methought I-crossed the dark-blue sea, and touched
a-gain thy strand;
And there I saw my-father's house, &c.

The intervals with which the voice passes over the hyphens in the first two lines are minor, but in the third line a modulation is made into a major scale, and the composer has skillfully taken care to produce a strong result of the new scale in the first two syllables: the effect of the change is strikingly appropriate.

What is the minor scale? This question has been differently answered by different writers on the theory of music, who severally contend for one or another scale as *the true scale*. On this subject see the article 'Scale,' in the 'Penny Cylopædia.'

Our limits do not allow us to go further than may be necessary to point out the merest beginning of the mathematical theory of the scale. We should hardly have entered on the subject at all in the present work, but for the consideration that many practised musicians are either ignorant of the existence of the mathematical theory, or else believe it is too abstruse for them.

SCALENE, a name given by Euclid, in his definitions (but seldom or never afterwards used by him), to a triangle no two sides of which are equal to one another.

SCA'LIGER, JULIUS CÆSAR, was born on the 23rd of April, 1484, in the castle of Riva near the Lago di Garda. His real name was Della Scala, and he pretended to be descended from the princely family of the Scalas of Verona. Tiraboschi calls him the son of Benedetto Bordone, a native of Padua, who lived at Venice, carried on the trade of illuminator, and assumed the name of Scaliger, either because he had a scale for his sign or because he lived in a street called Scala. According to Scaliger's own account, he was in his 12th year made a page to the emperor Maximilian, whom he served for seventeen years, both in peace and war. Afterwards he retired to Ferrara, where he received a pension from the Duke of Ferrara. He afterwards served for some time in Piedmont under the French viceroy. At Turin he began the study of physic in his leisure hours and without leaving the army. About this time he also commenced learning Greek. As he advanced, his delight in his new studies increased, and this, as well as frequent attacks of the gout, induced him to give up his military life and to devote himself to his favourite pursuits. In 1525 he accompanied Antonio de la Rovera, who had been made bishop of Agen, to his new diocese, in the capacity of physician. At Agen he married Andietta de Rogues, a young lady of a noble and wealthy family, and here he lived until his death, on the 21st of October, 1558. He continued the practice of physic, and at the same time prosecuted his scientific and literary studies.

None of Scaliger's works were published before he had attained the age of forty-seven. He had a most tenacious memory and a sound understanding. His son praises him for his love of truth, but he was of a very irritable temperament and excessively vain. Though he provoked many bitter enemies, he had many friends among his contemporaries, and scholars of subsequent ages have bestowed on him extravagant eulogiums. But his fame as a scholar, though very great in his days, has been eclipsed by that of his son Joseph.

Among his works are:—'Commentarii in Hippocratis librum De Insomniis,' Græc. et Lat., Lyon, 1538, 8vo. 'De Causis Linguæ Latinæ Libri xviii.,' Lyon, 1540, 4to., reprinted at Geneva in 1580. 'Poetices Libri Septem,' Lyon, 1561, fol. This work perhaps contributed most to the reputation of the author, though it shows that he possessed more grammatical knowledge than profound critical or creative powers. 'In Theophrasti Libros Sex de Causis Plantarum Commentarii,' Geneva, 1566, fol.; 'Commentarii in Aristoteli adscriptos Libros Duos de Plantis,' Geneva, 1566; 'Aristotelis Historiæ Animalium Liber Decimus, cum vers. et comment.,' Lyon, 1584, 8vo.; 'Animadversiones in Theophrasti Historias Plantarum,' Lyon, 1584, 8vo.; 'J. C. Scaligeri adv. Desid. Erasmum Orationes Duæ, Eloquentiæ Romanæ Vindices, cum ejusdem Epistolis et Opusculis,' Toulouse, 1621, 4to. Scaliger also published some Latin poems, which however are of very little value. The style is often obscure and bombastic.

SCALIGER, JOSEPH JUSTUS, the son of Julius Cæsar Scaliger, was born on the 4th of August, 1540, at Agen. He received his earliest instruction from his father. At the age of eleven he was sent to the College of Bordeaux, where he applied himself chiefly to the Latin language. His education was continued at Agen under his father, who taught him Latin well. After the death of his father he went to Paris, where he devoted himself principally to Greek. At first he attended the lectures of Adrianus Turnebus, but he privately read the Greek writers by himself. He commenced with Homer, and in two years he read nearly all the Greek authors. He also turned his attention to Oriental languages, which he learned by himself.

From about 1565 till 1593 we know very little of the life of Scaliger. It must have been during this time that he left the church of Rome and became a Protestant. In 1593 he was invited to the chair of belles-lettres in the university of Leyden, where he spent his life, devoting himself to the elucidation of antiquity. He was one of those great scholars who have been the ornaments of the university of Leyden. Among his numerous pupils was Hugo Grotius. In Holland Scaliger was absorbed in his studies, and he was sometimes in a state of absolute poverty. Several persons of distinction, who esteemed his talents and his learning, generously offered to extricate him from his difficulties, but his pride never allowed him to accept any present. He was never married. He was exceedingly proud, and, like his father, he treated his literary opponents with the most perfect contempt. Scaliger died of dropsy on the 21st of January, 1609.

As a critic, there are very few scholars who can be compared with Scaliger. He had prodigious learning, and great acuteness. Although in his verbal criticism and in his emendations and con-

jectures he is often too bold, yet all that he has done bears the impress of his great genius.

The greatest among the numerous works of Joseph Scaliger is, 'De Emendatione Temporum,' Paris, 1583, folio. A corrected and much improved edition of this work appeared at Geneva, 1629, folio. In this work Scaliger, for the first time, explained the Julian period in a satisfactory manner, and established a sound system of chronology. Some errors in this work were corrected by Scaliger himself, in another work, entitled 'Thesaurus Temporum,' &c., the best edition of which is that published at Amsterdam, 1658, in 2 vols. folio. His poems have little merit, but his Epistles are very instructive, and also valuable for the literary history of his time. Scaliger also edited many ancient authors with emendations and annotations, and there are few ancient writers for whom he has not done something.

SCAMMONY. [Convolvulus Jalappa.]

SCAMOZZI, VICENZIO, was born in 1552 at Vicenza, where his father practised as an architect. He was taught by his father the elementary part of architecture, and then sent by him to Venice, where he is said to have studied under Palladio. He first visited Rome in 1579. On his return he fixed his residence at Venice. Almost his first work was to complete the public library commenced by Sansovino. He was afterwards employed to finish Palladio's Teatro Olimpico at Vicenza, to which he added the fixed scena, with its three avenues of buildings shown in perspective, but executed in relief. This gave such satisfaction that in 1588 he was employed by the Duke Vespasiano Gonzaga to erect a similar theatre at Sabbionetta, of which structure nothing now remains.

Scamozzi soon after this period visited Poland, and passing through Salzburg was introduced to the archbishop, by whom he was afterwards employed (1604) to design the cathedral of that city, which may be considered as his work, though not completed till 1628.

Besides many noble private habitations erected by him both in the city of Venice and on the Venetian territory, he built several churches. But the work which has chiefly contributed to his fame, is the range of building on the south side of St. Mark's Place, called the Procuratie Nuove, commenced by him in 1586. Among his other works are:—the Palazzo Roberto Strozzi, Florence; the Palazzo Pretorio, Vicenza; the Palazzo Pretorio, Bergamo; the Villa Duodo, and seven small churches or chapels at Monselice. Thus engaged, he did not complete the work he had contemplated for many years, his 'Architettura Universale,' which was to have been in ten books. Only six appeared, and those were published only a few months before his death, which occurred Aug. 7, 1616.

SCANDAL. [Defamation; Libel; Slander.]

SCANDAL (*Scándalum Mágnatum*, slander of great men). By the statute 2 R. II., c. 5, confirmed 12 R. II., c. 11, as to 'devisers of false news and tellers of horrible and false lies of prelates,' &c.), it was enacted that none devise or speak false news, lies, or other such false things of the prelates, nobles, and great men of the realm. Upon this statute is founded the action of scandalum magnatum, which is now fallen into disuse, and superseded by the common action of libel and by criminal information. [Libel.]

The term *scandalous* is applied to matter in a Bill or Answer in Equity which reflects on the character of a defendant or plaintiff, and is at the same time irrelevant. Such matter will be struck out on exceptions being taken to it and allowed.

SCANDER-BEG, prince of Albania, whose real name was George Castriota, was the son of John Castriota, one of the rulers of that country. He was born in 1404. His father having become a tributary to the Turks, Scander-beg was brought up at the court of Murád II., who had him educated in the Mohammedan religion. Scander-beg rose in favour with that sultan, who gave him the appointment of Sanjac-beg, with the command of five thousand cavalry. On the death of his father in 1432, his family dominions were seized by Murád. Scander-beg resolved to regain his principality. Having accompanied the Turkish army to Hungary, he allied himself with the celebrated Hunyade, waywode of Transylvania, and largely contributed to the defeat of the Turkish army on the plain of Nissa (Nov. 10, 1443). Scander-beg left the camp with three hundred Albanians, appeared before Croia, massacred the Turkish garrison, and ascended the throne of his fathers, having previously renounced the Mohammedan religion. A long warfare ensued; but although frequently obliged to retire to the fastnesses of the mountains, Scander-beg renewed his attacks upon the first favourable occasion, and in this manner destroyed a vast number of his enemies. He was at length carried off by sickness at Lissa in the Venetian territory, Jan. 17, 1467, in the 63rd year of his age, leaving a son of tender years, whose guardianship he entrusted to the republic of Venice. His death however was soon followed by the entire submission of Albania to the Turkish yoke. [Albania.] There are various chronicles of Scander-beg: the principal and the best is that of Marino Barlesio, his contemporary, which appeared for the first time at Frankfort, 1537, folio.

SCANDEROON, or *Iskenderoon*, or *Alexandretta*, formerly called Alexandria, a seaport town in the north of Syria, at the head of the Gulf of Scanderoon, which was founded by Alexander the Great. It is a very unhealthy place, and only owes its importance to its being the seaport to Haleb, or Aleppo. Its unhealthiness is in a great measure owing to the waters which flow down from the mountains, and collect in great marshes around the town. Niebuhr, who visited Scanderoon in 1766, says, that with the exception of the houses of the vice-consuls and merchants, it contains only sixty or seventy poor dwellings, inhabited for the most part by Greeks. He adds, that there are the remains of some buildings in the morass surrounding the town, which proves that the place was formerly much larger than it is at present.

SCANDINAVIA is a term adopted in geography and history, and is of great antiquity. The name Scandinavia occurs in Pliny ('Hist. Nat.' iv.

13), who mentions it as an island of unknown extent, but he obviously meant the large peninsula N.W. of the Baltic. The small sovereignties which existed in this peninsula when it first began to be noticed in history, became united into the two great monarchies of Sweden and Norway in the 12th and 13th centuries. Margaret of Denmark, at the close of the 14th century, succeeded in uniting the crowns of Denmark, Sweden, and Norway in her own person. By the union of Calmar (1397) these countries were never to be disjoined. Norway indeed remained united with Denmark up to 1814, but Sweden was separated from it in the middle of the 15th century. From that time the two countries of Scandinavia constituted separate states, until the year 1814, when Denmark was obliged to cede Norway to Sweden. [NORWAY; SWEDEN.]

SCANDINAVIAN LITERATURE. The ancient Scandinavian language, once common to the whole north-western portion of Europe beyond the Baltic, is now confined to Iceland. [ICELAND.] This dialect of the Gothic is the parent stock of both Swedish and Danish, the former of which tongues has retained more of the original character than the other; and if not for the literature they contain, in a philological point of view they deserve far more attention than they have hitherto obtained from Englishmen, since they throw considerable light on the history of our own language.

Literature, in the usual meaning of the term, was of exceedingly tardy development in both Denmark and Sweden; and learning continued for a long time to be confined to the Latin of the schools. The people however possessed an abundant stock of traditional poetical records, which scarcely lay any claim to individual authorship, being rather the embodying of the sentiments and feelings of an entire race than those of individuals. Of these national songs there are many distinguished by the title of 'Kiæmpe Viser,' or Heroic Ballads, which strains of romantic minstrelsy serve to give an idea of the compositions of the ancient bards or skalds. It was not until after the accession of Canute the Great (1014) that Christianity became the national religion. But literature can hardly be said to have been cultivated then. The sole monument of the period is the history (written in Latin) by Saxo Grammaticus, who died in 1208. In the 15th century the University of Copenhagen was established by Christian I., and opened in 1479; yet it was long before either that event or the adoption of the principles of the Reformation effected any improvement in the intellectual condition of the people.

In the meantime the Danish language, now one of the softest in sound and most simple in construction of all the Gothic dialects, gradually borrowed more and more from the Low-German, but did not acquire any fixity until the 15th century. Its progress was greatly retarded by Latin being employed as the language of the clergy and students, and German as that of the court and the higher classes. The most remarkable production of the 15th century is 'Den Danske Riimkronike' (or chronicle in rhyme) of Niel, a monk of Soröe, though it possesses scarcely any literary value in itself, otherwise than as a specimen of the language at that period.

With the Reformation came an impulse towards literature, from Germany. Romances of chivalry, legends, tales of magic, moralities, and similar works, were translated from that language, as were also some pieces of Hans Sachs, of the Dutch poet Cats, and even of the Scotch Lindsay. But the earliest literary name of note that has been preserved is that of Anders Arrebo, in the 17th century. This writer was born in the island of Aeröe, in 1587. His chief production is his 'Hexaemeron,' a poem in heroic rhyme, on the creation, in imitation of that by Du Bartas: it displays considerable refinement of language and versification. Thomas Kingo published a great number of poetical pieces in a work edited by himself, under the title of 'The Danish Mercury,' which were little more than rhyming chronicles of the events of the day. Kingo, who has been termed the Dr. Watts of Denmark, on account of the religious cast of his poetry, entered the church, and became bishop of Fynen. Jörgen Jörgenson Sorterup is almost the only other name of any importance belonging to this period. Inferior to Kingo in poetical feeling, he had the merit of breaking through the literary mannerism of the time, and striking into a different route. His 'Heltesange,' or heroic songs, wherein he celebrates the naval achievements of his countrymen and the victories of Frederic IV., revive the animated strains of the older Kiæmpe Viser. But Sorterup and his immediate predecessors constitute only the first faint dawnings of Danish literature, which in Holberg suddenly attained to a noon-day brightness. [HOLBERG.] Contemporary with Holberg were Gram, Falster, Sneedorff, and Tullin. Though his productions were inconsiderable in number, Christian Falster acquired no small repute as a satirist, in which character he wrote in a still bolder and bitterer tone than Holberg himself, while as a poet he was certainly superior to him. His satires went through several editions between 1730 and 1750. To Sneedorff the language itself is greatly indebted for the example which he set of a pure, elegant, and graceful style. These qualities rendered his periodical, entitled 'The Patriotic Spectator,' exceedingly popular. Tullin gave to poetry the charm of melody, ease, and richness; on which account, although not a poet of the first order, he may fairly be considered a master in the mechanical part of the art. In that respect he may be classed with Pope, and he also occasionally resembles the English poet in his moral strains.

We now arrive at a period of the literature, of its poetry especially, which may be designated as that of Evald [EVALD], for he impressed upon it a character till then unknown, vivifying it by his own fervid genius. If Holberg was the founder of Danish comedy, Evald was the creator of the national tragedy. Contemporary with Evald, his coheritor in indigence, his counterpart in many respects, his opposite in others, was Johan Herman Wessel, who, like Holberg, was a native of Norway, and like him possessed much comic talent and turn for humorous satire. Of these qualities

he gave proof in his dramatic epigram or parody entitled 'Kierlighed uden Strömper' (Love without Stockings), 1772. His tales in verse earned for him the name of the Danish La Fontaine.

For convenience sake we may here put together the names of the brothers Trojel, Bull, Weyer, Fasting, Samsöe, Storm, and Suhm, as those of the principal writers of the time who closed their career before the end of the century. Peter Magnus and Peter Cofod Trojel claim notice chiefly for their songs and bacchanalian lyrics, a species of poetry in which the Danes have greatly distinguished themselves. Magnus is also known by his satires and poetical epistles, some of which possess considerable merit. Bull was the author of some ethic and didactic poems. Niels Weyer was a poet of more than ordinary promise, but he died at the age of twenty-one. Claus Fasting obtained more celebrity by his epigrams, some of the best in the language, than by his tragedy of 'Hermione.' Edward Storm gained a well-deserved reputation by his tales, fables, and ballads. Suhm's 'History of Denmark' (in 11 vols.) displays extraordinary diligence, and is a work of great merit, though its value is now in some degree lessened by recent productions of the kind, such as G. L. Baden's (in 5 vols., 1829–32) and L. C. Müller's (2 vols., 1835–6).

Before the close of the century a new school, at least a new generation, had begun to spring up. Both Rahbek and Baggesen had already made themselves favourably known to the public, and the first had already done much towards popularising a taste for literature by his two periodical publications, the 'Minerva' (commenced in 1785) and the 'Danish Spectator,' both of which obtained merited success. About the same time Baggesen had made himself a favourite by his 'Comic Tales,' decidedly the best of their kind in the language; while, in his 'Labyrinthen,' or Tour through Germany, Switzerland, &c., he had produced the most admirable specimen of a prose style that the literature possesses. The fame of Oehlenschläger, a name now of European celebrity, may be dated from the first years of the 19th century, the poetical pieces by him, which appeared in 1803, being almost the first of his published productions; and in the following year the first book of his modernised version of the 'Edda,' printed in Rahbek's 'Charis.' In his dramas and some other works he has reopened the stores of ancient Scandinavian fable and mythology, and revived the olden spirit of his fatherland.

At the end of the 18th century the Danish drama was signalised by one of the best productions of its kind which had then appeared, 'Niels Ebbesen,' a tragedy, by Christian Levin Sander. Shortly afterwards (1804) appeared 'Det Befriede Israel' ('Israel Delivered'), an epic poem in hexameters, by Jens Michael Hertz, which was certainly a failure upon the whole.

Otto Horrebow, Edward Colbiornsen (who died about 1791), and W. H. F. Abrahamson, all possessed considerable poetical talent in compositions of a descriptive or didactic class. About the same time appeared three volumes of comedies and

other dramatic pieces by the elder Heiberg, some of the best original productions that had then been given to the stage since the days of Holberg.

Jacob Baden did much for the language by his 'Grammar Raisonné,' by his 'Critical Journal,' and by various philological treatises which have become established authorities for idiom and style. He is also known by his able translation of Tacitus. J. C. Tode, a German by birth and a physician by profession, distinguished himself as a humorous writer, and his 'Moralske og Satiriske Afhandlinger' (1793) exhibit him to great advantage, and show him to have possessed a fund of pleasantry. His Fables are also among the best in the language. Foersom published a translation of Shakspere, which, says Feldborg, 'is as much a work of genius as a statue of Thorwaldsen's or a tragedy of Oehlenschläger's.'

The year 1821 deprived Denmark of four of its poets—Rein, Thaarup, Zetlitz, and Pram. Rein holds a subordinate rank, although his narrative pieces possess much merit. Thaarup produced two of the best and most popular operas in the language, and distinguished himself in the higher species of lyric poetry, especially in his Hymns and Cantatas. Zetlitz occupies a respectable station by his satires and poetical epistles, and also by his heroic odes. Relative to Pram we need add nothing here to the account already given of him. [PRAM.] Baggesen's is a name which stands out prominently from those of almost all the rest of his countrymen, he being in that respect nearly upon a level with Oehlenschläger; and the extended celebrity which they both enjoy is due to another cause besides the intrinsic merit of their works, namely, to their having written many of them in German, or afterwards reproduced them in that language. Baggesen was a writer of varied talents, and in his lyric pieces he touched every mood, from the sublime to the burlesque, from the gay to the pensive. In his other writings he frequently showed much of Voltaire, of Wieland, and of Sterne.

Less gifted than Baggesen, with more of industry and of tact than of superior talent, Rahbek raised himself to an honourable place in Danish literature. It was as a journalist, critic, and literary historian, rather than as an original writer, that he commanded attention, for in the last character he was merely pleasing and agreeable, without displaying much peculiar power of any kind.

After Rahbek, we come to Oehlenschläger himself, Ingemann, and others. The writings of the first-mentioned alone would form the subject of a long analysis, and have in fact been frequently so examined both in German and in English periodicals.

Denmark now possesses among its living writers several able dramatists; one of the most recent of whom, Hertz, has revived the true tone and spirit of comedy; while the younger Heiberg has cultivated the romantic and poetical drama with great success, and likewise rendered himself a favourite with the public by his vaudevilles. Chr. Bredahl's 'Dramatiske Scener,' 5 vols., 1819–32, display marks of real genius.

In other branches of literature Denmark has had several eminent scholars and men of science; and we may mention in particular those, as Rask and others, who have shed so much light on Scandinavian and also on English antiquities.

Sweden.—Though the modern literature of Sweden developed itself more tardily than that of Denmark, its course was nearly the same. The Scalds continued to recite their compositions at the court of the Swedish princes till about the middle of the 13th century, when the last Skald upon record was Sturle Thordson, in the reign of Berger Jarl.

For a long time Swedish literature is little more than a dreary blank. Even learning was scarcely cultivated, for though the University of Upsala was founded in 1478, it languished through neglect and for want of teachers, and can hardly be said to have been effectively established till the time of Gustavus Adolphus (1621-24).

With her patriot Vasa (1523-60), a new æra dawned upon Sweden. That prince founded the royal library at Stockholm, established schools, and favoured the doctrines of the Reformation, in which he was seconded by the chief scholars in the kingdom. In the reign of John III. literature and the sciences were neglected for political and theological disputes; but in that of Charles IX. they began to revive. Gustavus Adolphus was gifted with more than ordinary powers of eloquence, and his address to the states (1620) may be considered a model of that oratory. This prince began to compose his own memoirs, which are scarcely less admirable for their style than interesting for their matter. Inseparably connected with the name of Gustavus Adolphus is that of Axel Oxenstierna (1583-1654), one of the most eminent of statesmen, also a patron of letters.

The family of the Messenii is one of some note in the literary annals of Sweden. Johannes Messenius the elder (1584-1637) conceived the plan of dramatising the history of Sweden in a series of fifty plays, six of which he completed. They have gone through several editions; but he was not the rival though the contemporary of Shakspere.

Jöran or George Stjernhjelm, ennobled by Gustavus Adolphus, and patronised by Christina, had considerable reputation as a poet, in which capacity he furnished the court ballets or masques. Stjernhjelm also published the 'Codex Argenteus,' with a translation. His contemporaries Rosenhane and Spegel distinguished themselves—the one by his sonnets, in which he showed himself a disciple of Ronsard; while the other was an imitator of Du Bartas. Spegel also compiled a dictionary of the Swedish language, which was greatly extended by Ihre.

Among the literary men of the 17th century, the elder Rudbeck has left a monument of extraordinary erudition, but also of wild and extravagant hypotheses, in his 'Atlantis' (4 vols. fol.). With them may be mentioned the two Perinskiolds, who revived the study of Icelandic literature.

The commencement of the 18th century was by no means propitious to literature in Sweden. The age of laborious erudition had passed away,

and that of the belles-lettres can scarcely be said to have begun before the reign of Gustavus III. But if there were no other name than that of Olof von Dalin, it would suffice to vindicate the national taste at this period, he being not undeservedly regarded as the Swedish Addison. He not only set the example of a more graceful and polished prose style, but entertained while he instructed his readers. The 'Svenska Argus' (begun in 1733, when the writer was only twenty-four) obtained as marked success as the English 'Spectator.'

To the same epoch with Dalin belongs Madame Nordenflycht, whose elegies and other poems occasionally display real feeling and talent, though they are for the most part in a false taste, and disfigured by affectation. Gustavus III. (1772-92) an illustrious patron of literature and art, was unfortunately prepossessed in favour of French models. Hence the literature of his time bears more of a French than a national physiognomy. Nevertheless much good was effected, by an impulse being then given, which afterwards took a better direction. Besides reorganising the Swedish Academy of Stockholm (1786), Gustavus established several other institutions, and liberally supported the two universities of Upsala and Lund; and although his literary taste was French, he exerted himself very much in behalf of the Swedish language.

From the commencement of his reign the names of literary persons begin to be numerous. Olof Rudbeck displayed originality and talent for the comic epic in his 'Boräsiade,' a poem in four cantos, describing the heroic contest between the citizens of the town of Borås, under their burgomaster, and the desperate rebel Hofmann. Creutz's 'Atis och Camilla,' a descriptive poem in five cantos, is considered the best work of its kind in the language; while, if not entitled to rank as an epic, Gyllenborg's 'Täget ofver Belt' displays much vigour of imagination and happy execution. Gyllenborg produced also some dramatic pieces; and as a fabulist he has a high reputation.

Bellman is generally styled the Swedish Anacreon, a title that detracts almost as much as it compliments, for he has borrowed nothing from the ancient bard. A strong vein of nationality and racy humour pervades all his principal productions—his 'Fredman's Epistles,' his songs, &c., which rendered him at once the favourite of all classes. As he wrote so he lived, as he lived so he died—a staunch devotee to Bacchus.

In some respects Lidner was quite opposite to Bellman, and in others greatly resembled him. Nothing can be more unlike the gay and joyous effusions of the one than the sombre, plaintive, and touching strains of the other; but the love of wine was the same in both, or rather Lidner carried it to a degree of coarse intemperance. Nevertheless, with all his follies and vices as a man, with all his imperfections as a writer, Lidner possessed that spark of genius which still recommends his poetry.

Among those literary men who enjoyed the favour of Gustavus, was Kellgren, a pleasing poet, full of ingenious and happily-expressed ideas, set

off to advantage by the elegance and harmoniousness of his versification. Both by his lyrical pieces and his satires he rendered himself deservedly a favourite. His successor at the Swedish Academy, Stenhammer, distinguished his brief career by his ode on the battle of Svensksand, and a poem on the importance of religion to states, both of which are masterpieces of their kind. Magnus Lehnberg advanced pulpit eloquence very far beyond any of his predecessors in Sweden. Thorild, the literary antagonist of Killgren, distinguished himself scarcely less as the zealous but unsuccessful champion of the liberty of the press than as a writer. Among his poems that on the Passions is esteemed the best, but his more important productions are in prose. Professor Hoijer was also an able writer on philosophy, æsthetics, and criticism, which he treated in a masterly and eloquent style, and with great clearness.

Madame Lenngren manifested a peculiar vein of poetry, adorning familiar subjects with the simple graces of nature and truth, and observing a happy medium between affected refinement and vulgar literal reality. Her 'Grefvinnans Besök' (Visit to the Parsonage), 'Den Glada Festen,' and 'Porträtterne,' are charming pictures of domestic life. The Baroness d'Albedyhl wrote 'Gefion' (Upsala, 1824), a little epic poem in four cantos, and she has been styled the Swedish Sevigné for the elegance of her epistolary style. We will here, for convenience sake, group together Adlerbeth and Leopold, before we mention Stagnelius, Vitalis, and Nicander, who may be considered as more particularly belonging to the *Phosphorists*, or new romantic school, as opposed to the *Classicalists*. In his original poems, particularly in his 'Epistles,' Baron d'Adlerbeth shows himself an amiable moralist and philosopher, but his tragedies are correct lifeless productions carefully modelled according to French dramatic rules. He also translated Virgil, Horace, and the 'Metamorphoses' of Ovid. Edelcrantz first attracted notice by his Eloge on Louisa Ulrica. Another much superior production of his is the 'Ode till Svenska Folket;' his merit however lay not so much in what he himself did as a writer, as in the services which he rendered to art and science, manufactures, commerce, and agriculture.

The veteran Leopold, whose career extended through so long a period, was looked up to as the leader of the classical or French school of literature, which was in fashion at the beginning of the present century. His tragedies are cold and declamatory, with little of real passion or poetry, though abounding with splendid rhetoric. The same may be said of his odes. He succeeded better in his tales and satires. As a prose writer he is deservedly considered a model of style.

Hammarskjold produced several interesting works on subjects of literary criticism, and among others one on the character of Schiller as a poet, historian, and philosopher (1807); also a series of lectures on the history of literature and the fine arts in Sweden (1818-19). Stagnelius, Vitalis, and Nicander belonged to the new school; they all possessed strong poetical power, and all died in the prime of life. Stagnelius, the most highly gifted of the three, whose literary career commenced in 1812 and was closed in less than twelve years, resembled Novalis. His works, comprised in three volumes, consist of 'Vladimir,' 'Blenda,' 'Gunlög,' fragments of two other epic poems, tragedies and other dramatic pieces, and his lyrical and miscellaneous compositions. But it is as a lyric poet that he excels; the finest passages in his tragedies and his epics are all of a lyrical cast; and among his lyrics the series of religious pieces entitled 'The Lilies of Sharon' are pre-eminent. Eric Sjöberg is better known under the assumed name of Vitalis. His life was one of struggle, privation, and hardship; and he closed it within the walls of a public hospital. Although flashes of mirth and satiric pleasantry occasionally occur in his poems, the pervading character of most of them is melancholy and tenderness, and a weariness of spirit longing to be at rest. As to Nicander, we refer to a previous article [NICANDER]. Wallin, archbishop of Upsala, acquired well-merited popularity both as a preacher and a poet. His sermons and discourses are noble specimens of pulpit eloquence. Nearly all his poetical productions are of a devotional cast, and his psalms have been generally adopted throughout Sweden.

Among the living writers of Sweden are several who enjoy a high reputation. Franzen, Tegner, and Ling are eminent as poets; but Tegner is decidedly the poet of the nation, and also the first in the estimation of foreigners. E. G. Geijer has written a history of the Swedish Nation, and a history of Sweden from 1719 to 1772. Next to Tegner, the name of Atterbom is most known beyond the limits of Sweden. He is one of the founders of the modern or romantic school; and is highly esteemed both as a poet and a prose writer. The department of prose fiction and the novel, is one that has been cultivated only recently in Sweden. The taste for this kind of literature has been cherished by the translation of Scott's historical romances. Among the writers of this class are, Frederick Cedesborg, Frederica Bremer, the Baroness Knorring, and Engerstrom.

SCANDIX, the name of a genus of plants belonging to the natural order *Umbelliferæ*. One of the species, *S. Pecten Veneris*, the Common Shepherd's Needle, or Needle Chervil, is a native of Europe and the north of Africa, and is very plentiful in the cultivated fields of Britain. *S. cerefolium*, the Garden Chervil, which is now referred to the genus *Anthriscus*, was formerly much cultivated in gardens, and was recommended by Geoffroi and Haller as a medicine in dropsy, hæmorrhoids, and other diseases. It is used in France as a salad, and in Holland as a potherb, but is not in much repute in this country.

SCANSORES, Mr. Vigors's name for an Order of birds comprising the Families *Ramphastidæ*, *Psittacidæ*, *Picidæ* [WOODPECKERS], *Certhiadæ* [CREEPER], and *Cuculidæ*.

Mr. Swainson also makes the Tribe *Scansores* consist of the Families *Ramphastidæ*, *Psittacidæ*, *Picidæ*, *Certhiadæ*, and *Cuculidæ*. ('Classification of Birds,' vol. ii.)

The Prince of Canino arranges under the Tribe

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Scansores the Families *Psittacidæ*, *Picidæ*, and *Cuculidæ*. ('Birds of Europe and N. America.')

Mr. G. R. Gray makes the order *Scansores* consist of the *Ramphastidæ*, the *Psittacidæ*, the *Picidæ*, and the *Cuculidæ*.

SCANTLING, a term used by carpenters to express the transverse dimensions of a piece of timber; and also, in some cases, as a general name for small timbers, such as the quartering for a partition, rafters, purlins, or pole-plates in a roof, &c. All quartering or squared timber under five inches square is designated scantling.

In masonry the same word is used to express the size of stones in length, breadth, and thickness.

SCAPTEIRA, Fitzinger's name for a genus of *Pristidactyle Cælodont Saurians*, according to the arrangement of Dumeril and Bibron. The genus *Scapteira* may be easily distinguished from the other Cælodont Pristidactyles, by their having the five toes smooth and flattened below; they are however dentilated laterally. One species only is recorded, *Scapteira grammica;* it is a native of Nubia.

SCA'PULA, JOHN, was probably a native of Lausanne. He lived during the latter half of the sixteenth and the commencement of the seventeenth century. He was employed at Paris in the printing establishment of Henry Stephens. The time of his death is unknown. Scapula is only known as the editor of a Greek dictionary. He was employed by Stephens at the time when that great scholar was printing his 'Thesaurus Linguæ Græcæ,' which was published in 1572. In 1579 Scapula published at Basel a 'Lexicon Græco-Latinum,' fol. This dictionary is in fact only an extract from the great work of Stephens. The sale of the 'Thesaurus' was greatly diminished by the publication of this abridgement. Scapula did not even acknowledge what he had done; on the contrary, he endeavoured to conceal the source from which he had drawn.

Scapula published a second edition of his dictionary at Basel in 1589. Other reprints appeared in 1594, 1598, 1605, 1611, 1627, 1637. The Elzevirs of Amsterdam published, in 1652, a fine edition in folio, which was reprinted, in 1665, at Basel. The last editions are those of Glasgow, 1816, 2 vols. 4to., and of London, 1820, 4to., edited by Major.

SCARABÆIDES, a very extensive group of Beetles forming the chief part of the section *Lamellicornes*. The *Scarabæides* of Latreille were regarded by Linnæus as a genus; but this great naturalist being acquainted with 87 species only, whilst the various collections at the present time contain together about 3000, it is natural that entomologists should have sought for characters among the species of this immense group, by which they might be divided into sections. Hence we find in the works of Fabricius (Linnæus's pupil) the present group raised to the rank of a family, and subdivided into several genera. These genera are however but few in number compared with those instituted by modern entomologists, which amount to nearly 200.

Latreille divides the *Scarabæidæ* into six sections, to which he applies the following names:—*Coprophagi*, *Arenicoli*, *Xilophili*, *Phyllophagi*, *Anthobii*, and *Melitophili*. [COLEOPTERA.]

SCARBOROUGH. [YORKSHIRE.]

SCARFING, the mode of joining two pieces of timber end to end, in such a manner that they may appear but one, and cannot be pulled asunder by a force applied in the direction of their length, without breaking off part of the wood at the joint. The scarfed pieces are usually bolted together; but there are various modes of forming the junction.

SCARI'TIDÆ, a family of Coleopterous Insects belonging to the section *Geodephaga*, which section corresponds to the genera *Carabus* and *Cicindela* of Linnæus. The *Scaritidæ* have the prothorax separated from the elytra by a narrow cylindrical neck; the mandibles are usually large, and armed with strong teeth on the inner side; the labrum is small; the mentum is furnished with a tooth; the antennæ are usually short, and have the basal joint long; the legs are short; the anterior tibiæ are broad, and strongly notched on the outer side, and fitted for burrowing; and the anterior tarsi in the males are not dilated. The body is usually elongated, and straight at the sides; the head, thorax, and elytra are nearly equal in width. The principal genera contained in this family are *Scarites*, *Pasimachus*, *Camptodontus Acanthoceles*, *Clivina*, and *Dischirius*.

SCARLATI'NA (originally written Scarlattina, from *scarlatta*, a red-coloured cloth), Scarlet Fever. Scarlatina, like Small-Pox and Measles, may appear as an epidemic, or it may be propagated by a specific contagion. As an epidemic, it most usually appears at the latter end of the summer and the beginning of autumn; sporadically, it is met with at all seasons. It further resembles Small Pox and Measles in rarely attacking twice the same individual. Scarlatina varies much in severity, from the mild febrile disturbance to that dangerous form of the disease which has received the appellation of Malignant. This difference has given rise to its division into three species, the *Scarlatina simplex*, *S. anginosa*, and *S. maligna*.

Scarlatina simplex is ushered in by rigors, followed by increased heat of the body, thirst, loss of appetite, and all the symptoms of inflammatory fever. On the second day of this fever, or somewhat later in the severer forms of the disease, patches of a scarlet-coloured efflorescence begin to appear on the face and neck, which extend downwards, and, coalescing, soon spread over the whole body. On the trunk however the rash is seldom uniform, but is distributed in diffuse irregular patches, the scarlet hue being most vivid about the flexures of the joints and on the loins. On the third and fourth days the eruption is at its height; even the mouth and fauces are not free from it, the papillæ of the tongue are unusually red and elongated, and the face is generally more or less swollen. On the fifth day the eruption begins to decline, disappearing by interstices, and is generally gone before the end of the seventh day. Between the eighth and twelfth days the cuticle comes off in the form of a scurfy desquamation, and the fever has subsided.

Scarlatina anginosa is a much more severe

form of the disease. Not only are the precursory febrile symptoms more violent, and the throat severely affected, but the whole course of the malady is protracted.

In *S. maligna* the fever is of a typhoid character, the pulse is small and feeble, the tongue and lips dry, and encrusted with a brown fur; there is delirium alternating with coma, and a fatal termination is frequent.

The secondary diseases induced by Scarlatina are Anasarca, Ophthalmia, inflammation of and discharge from the internal ear, with destruction of its drum, and consequent deafness, enlargement and suppuration of the cervical glands, Laryngitis, and chronic Bronchitis. The first-named of these diseases, Anasarca, is of very frequent occurrence, and arises from disease of the kidneys.

The treatment of Scarlatina must have reference to the constitution of the individual attacked, to the type of the prevailing fever, and to the particular form of it by which he may be affected. In the simple variety, little is required beyond keeping the patient quiet and cool, and restricting him to the use of a mild unstimulating diet. In the *S. anginosa*, the treatment as a general rule should be antiphlogistic, but general bleeding is not requisite, and is apt to retard recovery by reducing the patient's strength. Emetics are likewise recommended at the commencement of the disorder, and the bowels are to be kept open by means of gentle aperients. *S. maligna*, if seen at its commencement, is generally benefited by an emetic; but in a more advanced stage it requires the same mode of treatment which is adopted in all malignant fevers.

SCARLATTI, father and son, are persons of great celebrity in musical history.

Allessandro Scarlatti, founder of the Neapolitan school of Music, was born at Naples in 1650, and completed his studies under Carissimi. At Rome and Venice Alessandro produced many compositions, both for the church and theatre, with uniform success. He finally settled in his native city, and devoted himself to his art, the improvement of which was his most anxious wish. He at first turned his attention to the operatic overture, and soon gave a dramatic character to what till then had been without design and wretchedly meagre. He is also supposed to have originated violin accompaniments to airs, and likewise those symphonies, or ritornels, which afford variety and relief to the singer. The recitative obbligato is also indebted to him for vast improvement. The elder Scarlatti, we are told, produced two hundred masses, a hundred operas, and three thousand cantatas. He was, Dr. Burney says, author of the words of many of the last. He was knighted at Rome by Christina, queen of Sweden, and there died in 1725.

Domenico Scarlatti was born in 1683. He inherited the prudence as well as the talent of his father; and as the parent had profited much by his connection with so great a master as Carissimi, so the son derived at least equal advantages from his acquaintance with Handel, whose friendship he acquired while both were residing at Venice. So much attached was the young Italian to the celebrated Saxon, that he followed him to Rome, and only quitted his friend on receiving an appointment in the service of the king of Portugal. After various changes, he finally, in 1735, accepted an invitation to Madrid, as master of the royal chapel and teacher to the queen, who had been his pupil at Lisbon. He died in that city in 1751.

Domenico left many operas and other compositions; but his 42 'Suites de Pièces pour le Clavecin' is the work by which he is now known, and on which his reputation solely rests. Domenico Scarlatti left a son, *Giuseppe*, born at Naples in 1718, who composed some harpsichord music, and many Italian operas, all of which were popular in their day. He died at Vienna in 1776.

SCARLETT, RIGHT HON. SIR JAMES, LORD ABINGER, was a native of Jamaica, and was born in or about the year 1769. At an early age he was sent to England. About 1786 he was entered at Trinity College, Cambridge. He took his degree of B.A. in 1790; and was called to the bar 8th of July, 1791. His success at the bar was very decided from the first, and every year added to his reputation and his emoluments. In 1816, he received a silk gown; and from that date he was recognised as the leader of his circuit (the Northern), and as occupying also a foremost place in Westminster Hall.

He was introduced to the House of Commons in 1818, as one of the members for the city of Peterborough, under the patronage of Earl Fitzwilliam. Though he did not however make a figure in parliament corresponding to his eminence at the bar, he supported Sir Samuel Romilly and Sir James Macintosh in their efforts to mitigate the severity of the criminal law.

He was returned again for Peterborough at the general election in 1820; but he resigned his seat in 1822 to stand for the University of Cambridge, when however he was left at the bottom of the poll. Upon this he was re-elected for Peterborough. Up to this time he had been considered as belonging to the Whig party; but his opinions gradually assumed more of a Conservative complexion, and when the administration of Canning came into power in April, 1827, Mr. Scarlett, having been again returned for Peterborough at the general election in the preceding year, accepted the office of attorney-general. Having been once more returned for Peterborough he retained his place throughout the administration of Lord Goderich; was succeeded by Sir Charles Wetherell when the Duke of Wellington became premier in January, 1828; but was reinstated in May, 1829, upon the dismissal of Sir Charles for his opposition to the Roman Catholic Emancipation Bill; and, having been returned for Maldon at the general election in 1830, he remained attorney-general till the accession to office of the Whigs in November of that year.

At the general election in May, 1831, Sir James Scarlett was returned to parliament for Cockermouth. At the next, which took place after the passing of the Reform Bill, in December, 1832, he was returned, after a contest, for Norwich, along with Lord Stormont (now Earl of Mansfield). When this parliament was dissolved

in December, 1834, on Sir Robert Peel being appointed premier, Sir James Scarlett was made Chief Baron of the Court of Exchequer, and a peer by the title of Baron Abinger, of Abinger, in the county of Surrey, and of the city of Norwich.

Lord Abinger died of a sudden attack of illness at Bury St. Edmunds, while on the circuit, April 7, 1844. By his first wife he had three sons and two daughters. His eldest son succeeded him in his title. His eldest daughter married Mr. Campbell (now Lord Chief Justice) in 1821, and was created a peeress in 1836 by the title of Baroness Stratheden.

Lord Abinger was a skilful and dexterous advocate. In the great art of gaining verdicts he was unrivalled; and no practitioner at the bar had ever before received such large sums in fees in any year as he drew in the height of his practice.

SCARPA, ANTONIO, was born at La Motta, a small village of Friuli, in 1748. His parents were persons in humble life, and he was indebted to a distant relation for the means of commencing his studies, while yet very young, at the University of Padua. The death of his early benefactor soon left him dependent on his own resources; but he continued to pursue his studies with such diligence that he became distinguished above his fellows, and was honoured with the esteem and friendship of the illustrious Morgagni.

In the year 1772 Scarpa's acquirements had become so well known, that he was selected as the most fit person to fill the chair of anatomy in the University of Modena, which was then re-established. Here he published his first work, a treatise on the structure of the internal ear. The Grand-Duke of Modena, Francis III., to whom this book had been dedicated, nominated Scarpa in the same year to the post of surgeon-in-chief to the military hospital in his capital. Success abated nothing of Scarpa's habits of diligence. Having published another work, on the structure of the nerves, he set out on a journey to France, Holland, and England, during which he made the acquaintance of many eminent men. During his stay in Paris, the offer of the anatomical chair in the University of Pavia was made to him by the Emperor Joseph II. He was installed in it in the year 1783. His researches into the anatomy of the organs of smell and hearing, and his treatises on the nerves of the heart, and on the minute anatomy of bone, followed each other in rapid succession, and showed his unwearied assiduity. These works, and especially that on the nerves of the heart, which decided in the affirmative the long-disputed question whether the heart is supplied with nerves, had procured for Scarpa before the end of the 18th century a European reputation. But he still continued those labours to which he was so much devoted. In the year 1801 he published a valuable treatise on the diseases of the eye; and in 1804 his observations on the cure of aneurism appeared, to which a question proposed some years previously by the Parisian Academy of Medicine had given occasion. In 1809 he published a splendid work on hernia, which raised his reputation to the highest point. Three years afterwards he gave up the labour of public teaching, but received in the year 1814 the honourable appointment of Director of the Medical Faculty of Pavia. He pursued his favourite studies, though suffering for some years under almost total blindness, and the publication of the third and concluding volume of a collected edition of his minor treatises in 1832, preceded his death by only a few months.

SCARPANTO, the modern name of the island Cárpathus, which lies between Rhodes and Crete, from the latter of which it is distant 60 Roman miles, according to Pliny (iv. 20). We know scarcely anything of its history. It is mentioned by Homer (Il., ii. 676) under the name of Krapathos, and is spoken of by Pliny (v. 36) as one of the Rhodian islands. Strabo (x. 489, Casaub.) describes it as lofty, and 200 stadia in circumference, and says that it contained four towns, one of which was called Nisyrus. The sea between Rhodes and Crete was called the Carpathian Sea, from the name of the island.

SCARRON, PAUL, was born at Paris in or about 1610, and by a family arrangement was compelled to enter upon an ecclesiastical life, for which his character and habits were ill suited. For some years he pursued a loose and irregular course of life, in which, at the age of 27, he was stopped by the result of an act of gross indecency during the carnival at Mans: he and three companions covered themselves with honey, then rolled themselves in feathers, and thus appeared in public: the populace assailed them, and to escape they jumped into the Sarthe. The other three died in consequence of this adventure; and Scarron himself contracted maladies from cold and exposure, which rendered him for the rest of his life, to use his own phrase, an abridgment of human suffering. In 1652 he became acquainted with Madlle. d'Aubigné (afterwards Madame de Maintenon), whom he subsequently married. Chastened by her influence, the society of his house, always a favourite resort of the wits, became still more select and brilliant. Meanwhile his fortune became smaller and smaller; for on his marriage he had lost a canonry with which he had been presented, and his other chief dependence, the profit arising from the sale of his works, diminished greatly towards the end of his life. This however, like all other evils, he bore with unchanging gaiety; and his last days were only troubled by anxiety for the prospects of his wife. [MAINTENON.] He died Oct. 14, 1660.

His collected works have been published in various editions. The chief of them are, 'L'Eneide Travestie,' 8 books, continued by Moreau de Brazey; Comedies; 'Le Roman Comique,' the most lasting of his works; 'Nouvelles Espagnoles,' translated from the Spanish; and his Letters.

SCARUS, a genus of fishes of the family *Labridæ*. The species of this genus are remarkable for the structure of their jaws, which project, are convex in front and concave within, and present a sharp cutting edge. The teeth cover these jaws, being arranged upon their outer surface like scales, and are blended together in such a manner that their outlines are scarcely discernible. Besides these teeth on the jaws, there

are others on the pharyngeal plates, which are of a depressed transverse form. The body is of the same oblong oval form as in the Wrasses, to which fishes the species of the present group are closely allied. The scales are very large.

The *Scari* are inhabitants of the tropical seas, and from the brilliancy of their colouring, combined with the peculiar form of their jaws, have received the name of Parrot-Fishes. [LABRIDÆ.]

SCAURUS is the cognomen of a branch of the Patrician gens of the Aemilii. The Aemilii Scauri did not attain high honours until the latter period of the republic.

M. Aemilius Scaurus was born in 163 B.C. His father, though a patrician, was poor. The son first distinguished himself as a soldier in Spain, and afterwards (126 B.C.) he served under L. Aurelius Orestes in Sardinia. In 123 B.C., when he obtained the office of curule ædile, he was not able to exhibit to the people the customary games, but he made up this deficiency by a punctual fulfilment of the duties of his office. In 120 B.C. he was prætor urbanus. At the time when Hiempsal sought help at Rome against Jugurtha, Scaurus was among the first who urged the necessity of punishing the usurper, and did not, like many others, accept the bribes that were offered to him. In the year 116 B.C. he offered himself as a candidate for the consulship, but without success. In the following year however he obtained the consulship. During his consulship he carried two laws, one a Lex Sumptuaria, and another respecting the suffrage of freedmen; and he also triumphed over the Ligurians and several Alpine tribes.

In 109 B.C., while Scaurus was censor with Livius Drusus, he restored the Milvian bridge, and formed the Via Aemilia, which ran past Pisa and Luna to Dertona. In 107 B.C. Scaurus was made consul a second time. His unsuccessful competitor, P. Rutilius, brought a charge of bribery and corruption (ámbitus) against him; but he was acquitted. A short time afterwards, Q. Servilius Cæpio brought against him the charge of having enriched himself in an unlawful manner during an embassy in Asia, but Scaurus again escaped. Cæpio in 90 B.C., induced the tribune Q. Varius to accuse Scaurus of having instigated the Italian allies to take up arms; but Varius withdrew his accusation. It must have been soon after this event that Scaurus died, for in 88 B.C. his widow became the wife of Sulla, the dictator. During the latter years of his life he was much harassed by his personal enemies; and their charges, especially those which referred to his avarice, may not have been unfounded.

Scaurus, according to the opinion expressed by Cicero in several of his works, was one of the first of the Romans. Sallust, a strong party man on the opposite side, gives him a bad character. This partiality of Cicero for Scaurus arose partly from both of them belonging to the aristocratical party. Scaurus possessed some of the stern virtues of an ancient Roman, and though he was an inflexible aristocrat, he enjoyed the esteem of the people as well as of the senate, which is shown from the fact that all the charges brought against him fell to the ground. Although originally poor, he amassed immense wealth. Scaurus also distinguished himself as an orator (Cic., 'Brut.,' 29, 30), and wrote a work, in three books, containing the history of his own life, which is lost.

M. Aemilius Scaurus, son of the former, and afterwards the step-son of Sulla, increased his wealth during the proscriptions of Sulla; and during the war against Mithridates, when he served as quæstor in the camp of Pompeius, he accepted bribes for declaring himself in favour of Aristobúlus against Hyrcanus in Jerusalem. Pompeius however gave him the province of Syria with three legions, and there he remained until 59 B.C. During this time he made a plundering inroad into the peaceful country of Aretas, who could only prevent Scaurus from committing further robberies by a bribe of 300 talents. After his return to Rome he obtained the curule ædileship, 58 B.C. The games which he exhibited on this occasion far surpassed everything which the Romans had seen, and involved him greatly in debt. Soon after this he obtained the office of prætor, and in 35 B.C., during his administration of Sardinia, he extorted exorbitant sums from the inhabitants, in order to enable him to purchase votes in the approaching election for the consulship. But when he came forward as a candidate, the Sardinians, through the tribune P. Valerius Triarius, brought against him the charge of repetundæ; and other crimes were at the same time laid to his charge (34 B.C.). He was defended by six advocates, and among them Hortensius and Cicero; and he was acquitted. A great part of the speech which the latter made for him is still extant. A few days afterwards he was accused of ámbitus, and although Cicero defended him again, he was condemned, and went into exile.

M. Aemilius Scaurus the Younger is one of the worst specimens of Roman nobles towards the end of the republic. Yet Cicero twice undertook the defence of this unprincipled man.

SCELO'TES, Fitzinger's name for a genus of reptiles placed by MM. Duméril and Bibron among the Scincoidian Lizards. In this genus we find a decided step towards the ophidian type: the anterior extremities are wanting, but the posterior extremities still exist, each furnished with two toes, the internal being much shorter than the external. [BIPES; SAUROPHIS.] Example, *Scelotes anguineus*, Fitz.; *Anguis bipes*, Linn. Locality, Cape of Good Hope.

SCENE-PAINTING, for the theatre, is executed in *distemper*, that is, with colours mixed up with size, the design being first sketched, and accurately laid down to scale, from which the perspective outlines are transferred to the larger surface. Instead of beginning with dead colouring and then gradually working up his picture, the artist puts in all his effects at once (as in fresco-painting)—the full tone of the lights and shadows, finishing as he proceeds, and merely retouching those parts afterwards which require additional depth or brilliancy. It is important that the scene-painter should not only be well skilled in architectural delineation, but also well informed as to the styles of different countries and periods.

Much of the effect of scenery depends upon a skilful mode of lighting it; in which respect considerable improvements have taken place of late years, and the light is now occasionally thrown from above, as well as from the sides and the foot-lights. A variety of mechanical contrivances have also been brought to great perfection so as to imitate particular effects in the most deceptive manner, such as those of moonlight, where the moon breaks through the clouds and gleams upon water, &c.; changes of the sky from clear to stormy, or the contrary; the sudden glare of fire, &c.

With the exception of the Drop-Scene, which is let down between the acts, and is a single picture, the scenes of a theatre generally consist of several parts: of narrow upright pieces called Side-Scenes, or Wings; of Hanging-Scenes, painted to imitate a sky or ceiling; and of the Back-Scenes, which are either rolling scenes, let down from above, or Flats, which are pushed on from the sides, and meet in the centre. There are various other smaller portions of scenery used occasionally for balconies, &c., and many other contrivances and arrangements in order to produce pictorial effect.

SCEPA'CEÆ, a small natural order of plants belonging to the rectembryose group of Incomplete Exogens. They are natives of the tropical parts of India. The wood of one of the species, *Lepidostachys Roxburghi*, is very hard, and is used in India for making various utensils.

SCEPTICISM (Σκέψις), inquiry, circumspection, deliberation, doubt. There are two significations to this word: the one denoting doubt of an explanation of phenomena; the other the more precise indication of a certain class of philosophers who have continued sceptics, and whose system of thought in its fundamental points ever remained sceptical. To this latter we alone direct ourselves.

Socrates has been commonly called the founder of this sect by the enunciation of his famous tenet —all he knew was that he knew nothing. But this was more a limitation of the confidence of the Dogmatists and Sophists, and a confession of the weakness of the human understanding, than any fundamental scepticism, such as was subsequently embraced by Pyrrho and others. Sextus Empiricus, the historian of the sect of Pyrrho, defines it as 'the power (δύναμις) of opposing in all their contradiction the *sensuous representations* and the *conceptions of the mind* (φαινόμενα τε καὶ νοούμενα), and thus to induce perfect suspension of judgment' (Sextus Emp. 'Pyrrho. Hypot.,' i. 1, 4); and Carneades denied the possibility of real knowledge of anything from the twofold relation of the representation (image-idea, φαντασία) to the object (τὸ φανταστὸν), and to the mind (ὁ φαντασιούμενος), as the mind had no criterion of the truth: all that could be affirmed was mere probability (τὸ πιθανὸν). From the fallaciousness of sense, the differences of sensuous perceptions in different organisations, the weakness of understanding, and the impossibility of diving beneath the appearances to the real causes of things, the sceptics deduced a system of indifference which became equally difficult to accept or refute. They maintained that every proposition requires a prior proposition to support it, and so on in infinitum; or else it assumes some axiom which cannot be proved, and is to be taken for granted without demonstration, and consequently may be denied with the same force with which it is assumed. Further, that nothing can be known by means of itself nor by means of something else, whilst that other remains unknown, and that other must either be unknown or known by means of something else, and so on in infinitum. This last is extremely subtle, and in itself is irresistible; but, as Kant remarked, there is this fundamental flaw in absolute scepticism, 'that it gives out everything for appearance. It therefore distinguishes appearance from truth, and of course must have a mark of distinction; consequently presupposes a knowledge of the truth, thus contradicting itself.' The abnegation of man's proudest faculty, reason, the perpetual indecision on every point, so little accords with the fertile and prodigious activity and creative power of the mind, that the real professors of scepticism have been universally indolent, easy-natured, sensual men, with whom the speculative doubting was stimulus enough.

Modern scepticism differs little from the ancient, and whatever strides philosophy may have taken in other departments, it has made little or none in that of doubt.

Glanvill, the author of 'Scepsis Scientifica, or Confest Ignorance the Way to Science,' is the systematic sceptic of the 17th century, and his work is altogether a curiosity from the rarity of its notice, the extraordinary nature of its contents, and from its author having been a clergyman and member of the Royal Society, and from his having one year afterwards published a book in favour of witchcraft.

Hume was the greatest and the legitimate sceptic of the 18th century. His was genuine Pyrrhonism. He attacked the very foundations of our knowledge by contrasting with them their self-contradictions. 'The truth is,' observes Dugald Stewart, 'that whereas Berkeley was sincerely and bonâ fide an idealist, Hume's leading object was plainly to inculcate *universal scepticism*. In this respect the real scope of his arguments has, I think, been misunderstood by most if not by all his opponents. It evidently was not, as they seem to have supposed, to exalt reasoning in preference to our instinctive principles of belief, but by illustrating the contradictory conclusions to which our different faculties lead, to involve the whole subject in the same suspicious darkness, and to set their evidence aside as good for nothing.' ('Essays,' ii., c. 1.) Hume accepted Berkeley's arguments in disproof of external reality, but he went still farther; after denying a *substantive world* (consciousness being concerned only with ideas or representations), he denied on the same ground a *substantive mind*. For, he asks, as we know but impressions and ideas, how can we know that there is anything more than these? These are the substance and limit of our knowledge. If Hume is to be refuted, it must be, as Kant plainly saw, by a reconsideration of the very elements of perception, and an investigation of the received doctrines which Hume, assuming as established,

employed as first principles. This was the work of Kant.

SCEPTRE, from the Greek *skeptron* (σκῆπτρον), a staff, or rod, carried by princes as the ensign of power. The different forms in which the sceptre is represented upon ancient coins, are given in Rasche's 'Lexicon Rei Nummariæ,' v. *Sceptrum*.

SCHAFFHAUSEN, one of the cantons of the Swiss confederation, is situated north of the Rhine, and is bounded on the north, east, and west by the grand-duchy of Baden, and on the south by the cantons of Thurgau and Zürich, from which it is separated by the Rhine. It is one of the smaller cantons of Switzerland. The area is computed at 115 English square miles. The population in 1837 was 31,125. The people profess the Reformed religion. The language of the country is a dialect of the German, resembling that of Suabia. The surface of the canton is hilly, and the soil is mostly calcareous. The general slope of the valleys is southwards towards the Rhine, which drains the whole country. Agriculture constitutes the chief occupation of the people. The country produces corn, wine, flax, hemp, and fruits, especially cherries. The climate is mild, compared with other parts of Switzerland. The manufactures consist of leather, steel, cotton-spinning, and distilling of the kirschwasser. The canton has productive iron-mines; most of the ore is smelted in the furnaces of Laufen near the fall of the Rhine.

The canton is divided into six districts: Schaffhausen, Stein, Thayngen, Neunkirchen, Unterhallau, and Schleitheim. The only towns of the canton are Schaffhausen, Stein, and Neunkirchen, but there are many villages and hamlets. The government was formerly like that of most Swiss cantons, that is to say, the citizens of the head town were the legislators, and the country population was subject to them; but by the constitution of 1831 the democratic principle has become established.

The town of *Schaffhausen* is built on the side of a hill sloping to the bank of the Rhine, and is about 1200 feet above the sea. It is surrounded by walls flanked with towers, and has a fort, the vaults of which are bomb-proof. The streets are irregular, and most of the houses are old-looking, but many are modern and handsome. The most remarkable buildings are—the cathedral, the church of St. John, the town-house, and the arsenal. Schaffhausen has a college with ten professors, a gymnasium, several elementary schools, an orphan asylum, and several other public establishments. Schaffhausen was originally a hamlet of boatmen, and a place for unloading the goods which came down from the lake of Constance by the Rhine, the boats being obliged to stop here on account of the falls in the river below the town.

The small town of *Stein*, which is situated at the outlet of the Rhine from the Untersee, or lower lake of Constance, has a handsome bridge over the Rhine, and some remarkable old buildings. It carries on a considerable trade in wine. *Neunkirchen* is a small walled town.

SCHALCKEN, GODFREY, was born at Dort, in 1643. His father, who was rector of the college in that town, placed him under Solomon van Hoogstraten. He was afterwards a pupil of Gerard Douw, whose style and manner of handling he successfully imitated in small pictures of domestic scenes, chiefly represented by candle-light. Some English gentlemen encouraged him to visit England, where he met with success, till he attempted portraits on a large scale, in which he proved so inferior to Kneller, that he injured his reputation. On leaving England, he retired to the Hague, where he practised his art till his death in 1706.

SCHATZ, GEORGE, born at Gotha, Nov. 1, 1763, was deservedly esteemed in his day both as an original writer and a critic. He studied at the university of Jena, where it was intended he should apply himself to jurisprudence, but he occupied himself with Italian literature and poetry; and planned a translation of Tasso, and another of Macchiavelli's 'History of Florence,' which last he afterwards nearly completed. By the diligent study of nearly every European language and literature, he was enabled to supply a number of excellent essays and papers to different literary journals, including those on Ercilla and Camoens, in the supplement to Sulzer's 'Theorie der Schönen Künste.'

His original productions are not many, neither do they belong to a very high class. In his prose fables however he is second only to Lessing, while in his sonnets and madrigals he is a successful imitator of Petrarch. He died March 3, 1795.

SCHAUENBURG. [LIPPE.]

SCHAUMBURG. [LIPPE.]

SCHEELE, CHARLES WILLIAM, a distinguished chemist, who was born in December, 1742, at Stralsund in Pomerania, where his father was a tradesman. In 1773 he removed to Upsal, where he became acquainted with Bergman. Observing that fire could not be maintained without the presence of air, Scheele turned his attention to its analysis; and he discovered that oxygen, obtained from the air, is consumed in ordinary combustion: he called this newly-discovered gas *empyreal air*. These discoveries were published in his 'Chemical Observations and Experiments on Air and Fire.' Another and most important discovery which we owe to the labours of Scheele, is the elementary gaseous body now called chlorine, but which by him was named *dephlogisticated marine acid*.

In several papers in the Memoirs of the Stockholm Academy Scheele described various chemical substances unknown till that time, and also improved modes of obtaining them and others. He discovered tartaric acid, fluoric acid, and barytes, besides oxygen and chlorine; and published valuable experiments on manganese, benzoic acid, arsenic, arsenite of copper, molybdena, plumbago, milk, lactic acid, tungsten, Prussian blue, citric acid, malic acid, gallic acid, &c.

Scheele, whose labours were conducted under very disadvantageous circumstances, died at the early age of 44, at Köping near Stockholm, in 1786.

SCHEEMAKERS, PETER, born at Antwerp in 1691, was the pupil of his father and a sculptor

whose name was Delvaux. While still young he visited Denmark, where he worked as a journeyman. He was then so poor that about 1728 he travelled to Rome and thence to England, chiefly on foot. In England he obtained considerable employment; but he paid a second visit to Rome, and after a two years' residence there he settled about 1735 in England. The time of his death is not known, but according to his pupil Nollekens, as related by Smith, he returned to Antwerp in 1770, and there soon after died. Scheemaker's works are very numerous; they are elaborate in design and costume, but rather effective than grand. There are several monuments by him in Westminster Abbey and three in the India House. The bronze statues of Guy in Guy's Hospital, and of Edward VI. in St. Thomas's Hospital, are his works. He executed also some busts and many other sculptures for the gardens of Stowe.

SCHEFFER, JOHANN, was born in 1621 at Strasburg. The principal objects of his study while at Strasburg were the ancient languages and history, in both of which he made extraordinary progress, and in 1643 he published a very learned work, 'De Varietate Navium apud Veteres,' in 4to. He afterwards went to Sweden, where, in 1648, he obtained a professorship in the university of Upsala.

The life of Scheffer must have been one of incessant labour; for besides a great number of ancient authors which he edited with notes and emendations, he wrote in Latin many original works on various subjects. He died in 1679.

SCHEID, EVERARD, was born at Arnheim in Holland, in 1742. He devoted himself to the Eastern languages, principally the Hebrew and Arabic. In 1768 he was appointed professor at the University of Harderwyck, and afterwards succeeded Schultens at Leyden in the chair of Oriental languages. He died in 1795, soon after his appointment. Besides his edition of the 'Minerva' of Sanchez, Scheid left several valuable works on Eastern literature.

SCHELDE. [Belgium.]

SCHELESTADT. [Rhin, Bas.]

SCHELLER, J. J. G., was born in 1735 at Jhlow, a village in Saxony. He studied under Ernesti at the University of Leipzig, and devoted himself to theology and philology. In 1761 he was appointed head-master of the public school at Lübber. In 1772 he was made rector of the gymnasium of Brieg, in which office he continued until his death in 1803.

Scheller was the author of a Latin dictionary (Latin and German, and German and Latin), 8vo. The third edition, which was very much enlarged, appeared in 1804–5, in 7 vols., 8vo. Scheller's Dictionary was revised, and translated into English by J. E. Riddle, Oxford, at the University Press, 1835. All that is good in it is taken from Forcellini's Latin Dictionary. Scheller's other works are, 'Præcepta Styli bene Latini,' and a Latin Grammar, of little value, which has been translated into English.

SCHE'LTOPUSIK or SHELTOPUSIK, the ordinary name for a genus of reptiles, *Pseudopus* of Merrem.

Cuvier considered that the *Scheltopusik* was a serpent; and, in his last edition of the 'Règne Animal,' he arranged it at the head of the *Orvets* (*Anguis*); but most other herpetologists place it among the *Saurians*. MM. Duméril and Bibron arrange the form under their *Chalcidian Lizards*, or *Cyclosaur Saurians*.

In this snake-like Saurian there are no anterior limbs, and the posterior limbs are reduced to the merest rudiments, being represented by two small scaly appendages.

Example.—*Pseudopus Pallasii*, Cuvier. Locality, Dalmatia, Istria, the Morea, and the Mediterranean coasts of Africa; it is also found in the Crimea and in Southern Siberia. It haunts thick herbage and grassy places. M. Bibron assures us that the *Pseudopus D'Urvillii* of Cuvier and the *Pseudopus Fischeri* of M. Ménestriés not distinct species, being founded on the young of *Ps. Pallasii*.

SCHEMNITZ. [Hungary.]

SCHENECTADY. [New York.]

SCHEUCHZE'RIA, a genus of plants belonging to the natural order *Alismaceæ*, and the suborder *Juncagineæ*. *S. palustris* is the only known species of this genus. It is found in England and Scotland in bogs.

SCHEUFFELIN, or SCHAEUFFELEIN, HANS LEONARD, commonly called Hans Scheuffelin, a German painter and wood engraver, was born at Nürnberg about 1490. Young Hans was placed with Albert Dürer, with whom he was a great favourite. He remained in Nürnberg until 1515, when he removed to Nördlingen, where he died in 1539 or 1540.

There are paintings by Scheuffelin in Nördlingen, Nürnberg, Tübingen, Stuttgart, Oberdorf, and other places. There are also many woodcuts by him.

SCHEVENINGEN. [Holland.]

SCHIAVONETTI, LUIGI, was born at Bassano, in the Venetian States, April 1, 1765. Luigi displayed a talent for drawing, and at the age of thirteen was placed under Giulio Golini, or Goldini, who died about three years afterwards. Schiavonetti then turned his attention to engraving, and having been instructed in the art, was employed for a time in engraving for Count Remaudini. His skill in imitating Bartolozzi led to a connection with an engraver named Testolini, who eventually induced him to remove to London, where he resided for some time with Bartolozzi, and afterwards established himself. He continued the practice of his art till his death, June 7, 1810. Most of the works of Schiavonetti were small, though he executed some important plates, and was engaged, at the time of his death, on the large engraving of Stothard's 'Canterbury Pilgrimage,' which was finished by James Heath.

SCHIAVO'NE, ANDREA, called *Medula*, was born at Sebenico in Dalmatia, in 1522. He was placed with a house-painter at Venice, where he employed his leisure time in studying the works of Giorgione and Titian, and in copying prints after Parmigiano. The latter artist ultimately employed him with Tintoretto and others in the grand works for the library of San Marco,

where three entire ceilings are said to be by his hand. The work however which he painted for the church of Santa Croce, representing the Visitation of the Virgin to Elizabeth, gained him most reputation. Schiavone died at Venice in 1582.

SCHIDO'NI, or SCHEDONE, BARTOLOMEO, a painter, was born at Modena, in 1560. He seems to have formed his style by a study of the works of Correggio; and in the cathedral of Modena there is a picture of San Geminiano resuscitating a dead child, which has often been mistaken for a work of that master. Schidoni's juvenile performances in the public edifices of Modena had gained him considerable reputation, when the Duke of Parma appointed him his principal painter. The extraordinary beauty of his works has always caused them to be much sought after, and their value is enhanced by their extreme rarity. He died in 1616.

SCHIEDAM. [HOLLAND.]

SCHIEFER SPAR, *Foliated Carbonate of Lime*, occurs massive. Structure laminar. Colour white, reddish, yellowish, or greenish. Lustre pearly on the surface of the laminæ, and vitreous on the edges. Translucent. Specific gravity 2.740. It occurs in Cornwall, Scotland, and Ireland.

SCHILLER, JOHANN CHRISTOPH FRIEDRICH VON, was born Nov. 10, 1759, at Marbach, on the Neckar. He received his first instruction at Lorch; he was afterwards sent to school at Ludwigsburg, where he read Ovid, Virgil, and Horace, and also commenced Greek. The Duke of Würtemberg having founded a high-school at Stuttgardt, Schiller was admitted into it as a student of jurisprudence. Disliking this study, he changed it in 1775 for that of medicine, which however he seems only to have adopted as less tedious. He also studied history, but his time was chiefly spent in reading Homer and Virgil, and the German poets, especially Klopstock. But the popularity of Gerstenberg's 'Ugolino' and Göthe's 'Göz von Berlichingen,' inspired him with a dramatic impulse, and he wrote 'Der Student von Nassau' and 'Cosmus von Medici,' which he afterwards burnt, except some fragments of the latter, preserved and incorporated with the 'Robbers.' After taking his degree, he was appointed a physician in the army of Würtemberg, with a small salary. In 1781 he published the 'Robbers,' and in 1782 it was performed at Mannheim. The intense purpose and passion of the piece produced a wide-spread sensation and many imitations. The Duke of Würtemberg however ordered him to confine himself to his profession, and forbade him to publish anything except on medical subjects. Schiller, displeased with these restrictions, left Stuttgardt in October, 1782, and went to Mannheim, where Dalberg, the director of the theatre, was glad to receive him. Here he applied himself zealously to work, and in the course of a twelvemonth produced his two tragedies 'Fiesco' and 'Kabale und Liebe.' These two plays manifestly belong to the same period as the 'Robbers,' and are curious as evidences of the wild enthusiasm of a young poetic spirit.

In 1783 Schiller was appointed theatre-poet, a post of respectability and profit. He translated Shakspere's 'Macbeth,' with some alterations, and also some French plays for the theatre, besides discharging his other duties. In 1785 appeared the first number of the 'Thalia,' a miscellany containing essays, criticisms, &c., on the drama, edited by him, which was continued till 1794. In the first number the first three acts of 'Don Carlos' were inserted, which were highly admired. In the 'Thalia' also were published his 'Philosophical Letters.' His creed was a sort of mystical deism.

During the spring of 1785 Schiller removed into Saxony, and settled near Leipzig. Here he wrote 'Das Lied an die Freude' (Ode to Joy), one of his most beautiful creations. He then went to Dresden, where he finished 'Don Carlos.' In 1789 Eichhorn retired from the chair of history at Jena, and Göthe recommended Schiller to the place. Here he married Fraulein Lengefeld, and seemed at last comfortably settled. It was here, in addition to his lectures, that he worked at and published his 'History of the Thirty Years' War.' The philosophy of Kant was now producing its revolution in the world of thought, and Schiller embraced it with ardour. His æsthetic essays upon Kantian principles are some of the profoundest and most important speculations on art that we have met with.

In 1799 appeared 'Wallenstein.' This vast trilogy, which is his greatest work, and which exhibits greater knowledge, poetic power, and mastery over materials, than his other plays, still appears to be written on a false principle. The historic truth of the scenes of 'Wallenstein' may be admitted, but their dramatic purpose and power are comparatively small. Soon after the publication of 'Wallenstein,' Schiller once more changed his abode. The mountain air of Jena was prejudicial to his lungs, and he determined to go to Weimar, where his acquaintance with Göthe ripened into friendship.

In 1800 appeared 'Maria Stuart,' not the most successful effort of his pen, but it contains powerful writing, and is an evidence of increased knowledge of the stage. In 1801 was published 'Die Jungfrau von Orleans,' as direct a contrast to 'La Pucelle' as the earnestness and impassioned enthusiasm of Schiller were to the scepticism of Voltaire. This piece had unbounded success, and on the night of its first representation at Leipzig, the audience shouted the name of the author with great animation.

In 1803 he published 'Die Braut von Messina,' which was an experiment to see how far a tragedy constructed on the principles of the Greeks could move a modern audience. It was comparatively a failure. In 1804 'William Tell,' one of Schiller's finest dramas, was first produced. This was Schiller's last work. He had taken up his residence in Berlin during the preparation and performance of his tragedy. From Berlin he retired to Weimar, where he felt his end approaching, and died calmly May 9, 1805.

SCHINKEL, KARL FRIEDRICH, was born March 13, 1781, at Neu-Ruppin, in Brandenburg. When about fifteen he was placed as a

pupil with David Gilly, an architect at Berlin, but received the most important part of his education from Friedrich Gilly, the son of David, who had travelled, and had acquired more liberal and higher views of his art than were generally entertained at that time. Friedrich Gilly, however, died in 1800, soon after his return, at the age of thirty. Schinkel, though so young, had been instructed by Gilly to superintend the execution of some of his buildings, and after his death, he continued the engagements, pursuing at the same time his theoretical and artistic studies, and making designs of ornamental articles for modellers, metal-workers, and artizans of that class, in order to provide a fund to enable him to visit Italy. In 1803 he set out for Italy, first visiting Dresden, Prague, and Vienna; and after extending his route to Naples and Sicily, returned to Berlin in the spring of 1805. The state of affairs there offered little encouragement to architecture, and he turned to landscape-painting. One work of note was a large panorama of Palermo; and he also designed scenes for the theatre, a collection of which, including those for 'Die Zauberflöte' and 'Die Braut von Messina,' were afterwards published, and they recommended him to the king, who, as soon as tranquillity permitted him to turn his attention to the embellishment of his capital, began to employ Schinkel on those structures which have stamped a new aspect on Berlin. From the year 1815 he was incessantly and actively engaged. Among his earliest buildings were the Hauptwache, Theatre, and Museum, at Berlin. The designs of Schinkel however have not been wholly adhered to in their construction, as may be seen by reference to his 'Entwürfe,' an extensive series of designs of all his principal buildings. With such ready materials, a descriptive catalogue of his buildings might be easily drawn up, but we can merely mention a few of them: the Werder Kirche (Gothic), Bauschule, and Observatory, at Berlin; the Theatre at Hamburg; Schloss Krzescowice, Charlottenhof, and the Nicolai Kirche, at Potsdam. His 'Werke der Höheren Baukunst' contains a series of designs by him for the Palace at Athens, which he proposed to erect upon the Acropolis, but it was not adopted. In 1839 the highest rank in his profession was conferred upon him, that of Ober-Landes-Baudirector. His health soon afterwards began to decline, and he died Oct. 9, 1841.

SCHISM, SCHISMATICS. The Greek word *schism* (σχίσμα) is used several times in the New Testament in its literal sense of a rent or rupture; and also in a figurative sense for a division of opinion among a number of persons considered as constituting a whole. (John, vii. 43; ix. 16; x. 19; Acts, xiv. 4; xxiii. 7.)

In ecclesiastical writers, *schism* is nearly synonymous with *separation;* but in its stricter use schism is a separation from the communion of a church of members who do not differ from other members in religious doctrine. *Heresy* consists in a dissent from the *doctrines* of a church; *schism* in a dissent from its *government.*

The great Schism of the West occurred in the 14th and 15th centuries. After the death of Gregory XI. (A.D. 1378), the cardinals, being compelled by the clamour of the people of Rome to elect an Italian to the popedom, chose Urban VI.; but afterwards the leading members of the college retired to Fondi in Naples, and elected Clement VII., who set up his court at Avignon, while Urban remained at Rome. Clement was recognised as pope by France, Spain, Scotland, Sicily, and Cyprus, and Urban by the rest of Europe. This schism continued till the year 1417, when it was healed by the Council of Constance, which elected Martin V. to the papacy. The other great schism is that between the Greek and Latin churches.

SCHIZANDRA, a genus of plants belonging to the natural order *Anonaceæ. S. coccinea,* the Scarlet Schizandra, is one of our most beautiful greenhouse climbers. It is a North American plant, and is found in woods in Georgia, Florida, and the Carolinas. It is easily propagated by cuttings, and grows best in a light sandy soil.

SCHLEGEL, JOHANN ELIAS, the eldest of three brothers, all of whom distinguished themselves by their literary exertions, was born at Meissen, Jan. 28, 1718. While at the university of Leipzig his talents recommended him to Gottsched, then looked up to as the arbiter in matters of poetical taste, to whose 'Kritischen Beiträgen,' &c. he contributed several pieces, as he did also to the miscellany entitled 'Belustigungen des Verstandes,' &c., besides writing various dramatic compositions. On quitting Leipzig, he accompanied Von Spener to Copenhagen as his secretary, the latter having been sent as envoy to the court of Denmark. Here he brought out a weekly periodical, entitled 'Der Fremde,' which obtained for him considerable notice. He afterwards became acquainted with Holberg, who procured him the professorship of modern history and the appointment of librarian at the academy of Soroe, founded by himself. He died Aug. 13, 1749. A complete edition of his works, in 5 vols., was published by his brother Johann Heinrich, 1761–70.

SCHLEGEL, JOHANN ADOLPHUS, the second brother, born at Meissen, Sept. 18, 1721, studied at Leipzig with Elias, and, like him, began to make himself known in the literary world by his contributions to the two publications above mentioned. At Zerbst, where he was pastor primarius and professor of theology and metaphysics from 1754 to 1759, he made himself very popular as a preacher. Of his pulpit compositions several collections appeared at different times, the earliest being in 3 vols., 1754–58. As a poet he may rank among those who exerted themselves to introduce a better taste. He died Sept. 16, 1793.

SCHLEGEL, JOHANN HEINRICH, born in 1724, studied, like his brothers, at Leipzig, and afterwards became professor of history at the University of Copenhagen, and historiographer royal of Denmark. He died at Copenhagen, Oct. 18, 1780. He published a history of the sovereigns of Denmark of the house of Oldenburg, and several other works relative to that country. He also translated Thomson's 'Sophonisba' and some other tragedies from the English.

SCHLEGEL, AUGUST WILHELM VON, the son of Johann Adolph Schlegel, superintendent general of the Lutheran church of Hanover, and the brother of Friedrich Karl Wilhelm, was born at Hanover Sept. 8, 1767. He was sent to Göttingen to study divinity, which he soon abandoned to devote his time to philology. Though young, he soon distinguished himself as a classical scholar, for his Latin dissertation on the geography of Homer was praised by Voss, and Heyne intrusted him with making an index to his edition of Virgil. For some years Schlegel lectured at the university of Göttingen. His contributions to Bürger's 'Akademie der Schönen Künste' (especially his poem 'Ariadne,' and his essay on Dante), and to Schiller's 'Musen-Almanach' and 'Horen,' and his translations from Dante with commentaries, secured him a rank among the best writers of Germany. In 1797 he published the first volume of his translation of Shakspere. In the same year he was appointed professor in the university of Jena. He remained at Jena till 1802, a friend of Schiller, and an admirer of Göthe, who, however, did not return the sentiment. He then left Jena, and repaired to Berlin, where he gave public lectures on literature and the fine arts ('Vorlesungen über Literatur und Kunst des Zeitalters,') published in the 'Europa,' edited by his brother Friedrich. He remained at Berlin till 1805. In that year he made the acquaintance of Madame de Stael-Holstein, and for several years he accompanied her in her travels through various parts of Europe. The reciprocal influence of these two distinguished persons upon each other was very great, and may be traced in their works. At her suggestion he published in French a comparison between the 'Phèdre' of Racine and the 'Hippolytus' of Euripides, and this work was the foundation of his subsequent fame among the French. In 1808 Schlegel delivered at Vienna a course of lectures on dramatic art which were published under the title 'Vorlesungen über Dramatische Kunst und Literatur,' Heidelberg, 1809–1811. A new collection of his poems appeared in 1811, 2nd edition, 1820. At that time Schlegel and his brother Friedrich had succeeded in founding the modern romantic school of poetry and fine arts. 'Das Deutsche Museum,' a review which the brothers Schlegel founded in 1812, was the chief organ of the new school. In 1813 August Wilhelm accepted a secretaryship from Bernadotte, the crown-prince of Sweden, and wrote political essays. When Paris was taken, he repaired to the country-seat of Madame de Stael, and lived there till her death in 1818. About that time he was placed among the titular nobility of Germany, the privilege of which consists in putting the preposition 'Von' between the Christian and the family name of the person thus distinguished.

In 1819 August Wilhelm von Schlegel was appointed professor of history in the university of Bonn. He had ceased to be a poet, but he published several essays of undoubted merit in foreign languages. Such are, 'Le Couronnement de la Sainte Vierge, et les Miracles de St. Dominique: Tableau de Jean de Fiesole; avec une notice sur la Vie du Peintre,' Paris, 1817, fol.; an essay on the famous Venetian horses, which he declared to be of Greek workmanship, in Italian, in the 'Biblioteca Italiana;' 'Réflexions sur l'Etude des Langues Asiatiques, adressées à Sir J. Macintosh, suivies d'une Lettre à Mr. H. H. Wilson,' Bonn, 1832, &c. Previous however to his appointment at Bonn, and at the suggestion of his brother, he had made up his mind to study Sanscrit. As early as 1820 he founded the 'Indische Bibliothek,' a review exclusively devoted to Indian languages and antiquities. Specimens of Schlegel's Sanscrit scholarship are, 'Râmâyana,' with a Latin translation and critical notes, Bonn, 1829; 'Bhagavadgîtâ,' an episode of the celebrated Indian epic 'Mahâbhârata.' Some time before his death, which took place in May, 1845, he published 'Essais littéraires et historiques,' Bonn, 1842, 8vo.

SCHLEGEL, FRIEDRICH VON, was born at Hanover, March 10, 1772. His father, J. A. Schlegel, was brother of Johann Elias Schlegel and Johann Heinrich Schlegel. August Wilhelm von Schlegel was his brother. Friedrich Schlegel, after having received a liberal education, was placed in a mercantile house at Leipzig, but showed so little inclination and ability for the business that his father sent him to Göttingen to study philology. After a year's residence in this place, Schlegel went to Leipzig, where he continued his studies with great zeal. His first publication of any importance was 'Griechen und Römer,' Hamb., 1797, of which his 'Geschichte der Griechen und Römer,' Berlin, 1798, may be considered as a continuation. About 1800 he undertock, together with Schleiermacher, to translate Plato into German; but after the first sheets were printed, he resigned the whole to Schleiermacher. In 1796 he began editing, with his brother August Wilhelm, a literary periodical, called the 'Athenæum,' directed against the most popular authors of the time, especially Kotzebue and Iffland. Another work, with the same object, was 'Kritiken und Charakteristiken,' which he likewise edited with his brother. In 1799 Schlegel published at Berlin the first volume of a novel called 'Lucinde,' of which the morality was of a somewhat questionable character, and excited much discussion; though it was praised by some eminent men, Schlegel never completed the work. In 1800 he went to Jena, where he delivered a course of lectures on philosophy, which were received with great applause. In 1802 he published at Berlin a tragedy called 'Alarkas.' In the same year he delivered lectures on philosophy at Paris, and edited a monthly periodical called 'Europa,' of which only two volumes appeared (Frankfort, 1803–5). At Paris he also studied the arts, the languages of Southern Europe, and more especially the language and literature of the ancient Indians. His little essay, 'Ueber die Sprache und Weisheit der Indier,' Berlin, 1808, was one of the first works which appeared in Germany on the literature of India. The results of his other studies at Paris may be seen in his 'Geschichte der Jungfrau von Orleans,' Berlin, 1802; 'Sammlung Romantischer Dichtungen des Mittelalters,' Berlin, 1804; and 'Lother und

Maller,' Berlin, 1805. After his return to Germany he published a collection of his poems, Berlin, 1809. All these works, as well as his 'Poetisches Taschenbuch,' Berlin, 1806, and his epic poem 'Roland,' show the author's deep veneration for the arts, the poetry, and the whole social life of the middle ages. This feeling had taken strong hold of him, as appeared more manifestly from his embracing the Roman Catholic religion at Cologne in 1801. He now went to Vienna, where, in 1809, he was appointed imperial secretary at the head-quarters of the Archduke Charles. After the political wreck of Austria he returned to his literary occupations, and delivered a course of lectures on modern history ('Ueber die Neuere Geschichte,' Vienna, 1811), and on the history of ancient and modern literature ('Ueber die Geschichte der Alten und Neuen Literatur,' Vienna, 1815). The latter work has been translated into English. In 1812 and 1813 he edited the 'Deutsche Museum,' of which only two volumes appeared. Prince Metternich appointed him councillor of legation to the Austrian embassy at the German diet at Frankfort, but he resigned this office in 1818, and returned to Vienna, where he began a new periodical, called 'Concordia,' Vienna, 1820–21, with a view of reconciling the various opinions respecting church and state. In 1827 he delivered a course of lectures on practical philosophy ('Philosophie des Lebens,' Vienna, 1828), and in 1828 another course on the philosophy of history ('Philosophie der Geschichte,' Vienna, 1829, 2 vols.). Towards the close of this year Schlegel made a journey to Dresden, with a view to deliver a series of lectures, but while he was working them out, he died, Jan. 12, 1829.

Friedrich von Schlegel, together with Tieck and Novalis, were at the head of a literary revolution in Germany, which endeavoured to promulgate its principles in the two works above mentioned, the 'Athenæum' and 'Kritiken and Charakteristiken.' The new school which these writers established is characterised by the name of the *Æsthetico-Critical*, or *Romantic* school of poetry. Schlegel collected the greater number of his own writings, which were published in twelve volumes at Vienna, 1822.

SCHLEICHE'RA, a genus of plants belonging to the natural order *Sapindaceæ*. *L. tirjuga* is a native of insular and continental India, where the astringent bark, bruised and mixed with oil, is used as a remedy for the itch.

SCHLEIERMACHER, FRIEDRICH ERNST DANIEL, was born Nov. 21, 1768, at Breslau. His parents belonged to the religious sect called Moravians, and he was at first educated by that body; but he quitted them at the age of eighteen, and began a fresh course of study in the University of Halle, where he devoted himself with zeal both to philology and theology. In 1790 he undertook, for a short time, the education of the children of Count Dohna-Schlobitten, who lived at Finkenstein in Prussia. He next went to Berlin, and was engaged as teacher in the seminary for teachers, which was then conducted by Gedike. In 1794 he was appointed assistant preacher at Landsberg on the Warthe, but two years after he returned to Berlin, where he was engaged as preacher to the great hospital called the 'Charité' until 1802. Here he published several works, and contributed some essays to the 'Athenæum.' [SCHLEGEL, F. VON.] In 1799 he published his 'Discourses on Religion' ('Reden über die Religion, an die Gebildeten unter ihren Verächtern'). These discourses contain some of the finest specimens of German oratory, and are full of profound thoughts. In 1800 he published a work called 'Monologen, eine Neujahrsgabe,' and 'Briefe eines Predigers ausserhalb Berlin.' The last of these two little works was a reply to a public letter (Sendschreiben) addressed by some Jews to the Protestant theologian W. A. Teller. About 1800 Schleiermacher conceived the plan of translating with Fr. Schlegel the works of Plato, and when Schlegel abandoned the undertaking, Schleiermacher continued it by himself. This translation, which does not comprehend all the works of Plato, appeared at intervals, from 1804 to 1828, and consists of 3 vols., in 6 parts. It is the most correct and most beautiful that has ever been published in any European language. In 1802 Schleiermacher went to Stolpe with the title of court preacher, and here he wrote an admirable work called 'Grundlinien einer Kritik der bisherigen Sittenlehre,' Berlin, 1803, and another called 'Zwei unvorgreifliche Gutachten in Sachen des Protestantischen Kirchenwesens,' Berlin, 1803. While at Stolpe he received an invitation to a professorship in the University of Würzburg, but he declined the offer, as the Prussian government appointed him professor of theology and philosophy in the University of Halle (1802). After the political catastrophe of 1806, when Halle was made a part of the new kingdom of Westphalia, Schleiermacher went back to Berlin, where he delivered public lectures on theological and philosophical subjects. During this period of the political humiliation of Prussia, Schleiermacher fearlessly endeavoured to rouse the spirit of his hearers against the foreign oppressors. During this period he wrote—'Die Weihnachtsfeier, ein Gespräch,' Halle, 1806; 'Ueber den sogenannten ersten Brief des Paulus an den Timotheus,' Berlin, 1807; 'Gelegentliche Gedanken über Universitäten im Deutschen Sinne,' Berlin, 1808; and an essay on Heraclitus, which appeared in F. A. Wolf's 'Museum der Alterthumswissenschaften.' In 1809 Schleiermacher was appointed preacher at Trinity Church in Berlin; and in 1810, when the new university of that capital was opened, he was appointed professor of theology, and at the same time he began to take an active part in the business of the ministry for public instruction. In 1811 he was created a member of the Academy of Sciences at Berlin, and furnished some of the best papers on various subjects, but especially on particular points of the history of ancient philosophy. In 1811 Schleiermacher published 'Kurze Darstellung des Theologischen Studiums.' In 1814 he was made secretary to the philosophical section of the Academy. During the period which followed, Schleiermacher was partly engaged in new editions of

former works, or their continuations, and partly in publishing a number of smaller polemical writings, especially against F. A. H. Schmalz and C. F. von Ammon. In the autumn of 1833 Schleiermacher visited London, and he opened the new German chapel at the Savoy. He died Feb. 12, 1834. The whole of his works have been collected and published since his death (1835, &c.), in three sections. These include seven collections of sermons, which he had published at various periods. The works which Schleiermacher left in MS. were edited by Zabel, Berlin, 1835, 2 vols. 8vo.

SCHLESWIG and HOLSTEIN. These two duchies form the southernmost portion of the kingdom of Denmark.

Schleswig, sometimes called South Jutland, is situated between 54° 20′ and 55° 20′ N. lat., and between 8° 40′ and 10° 5′ E. long. It is bounded N. by Jutland, E. by the Little Belt, S. by Holstein, from which it is divided by the river Eider and the Kiel Canal, and W. by the German Ocean. The length, N. to S., is about 70 miles, and the breadth, E. to W., varies from 30 to 56 miles, not including the islands on the east and west coasts. The area is 3434 square miles. The population in 1845 was 362,900.

Schleswig is in general a level country. A range of low hills enters it from Holstein, and, traversing it from south to north, passes into Jutland. On the west coast there are low and rich marsh-lands, which are protected by dykes, twenty feet high, against the spring tides, which often rise to the height of thirteen feet. As the sea in many places deposits alluvium, new dykes are erected from time to time to secure these additions. The principal rivers are the Eider, the Widau, and the Aue. The east coast is not so low as the west coast, but it is equally fertile. The climate is on the whole temperate and healthy, but damper and less salubrious on the west than on the east coast. The country produces corn, pulse, flax, hemp, rape-seed, hay, clover, garden vegetables, and potatoes; and exports much agricultural produce, live stock, and fish. Wood is scarce, both for building and fuel. The country contains limestone, chalk, and slate, but no metallic minerals. The chief occupations of the inhabitants are agriculture, the breeding of cattle, and the fisheries. There are no manufactures of much importance. The inhabitants, who profess the Protestant religion, are partly of German, partly of Danish or Frisian descent.

The islands on the east coast are Arroe, Föhr, and Femern. *Föhr* has a circuit of about 100 miles, and an area of 25 square miles. It contains the port of Wyk, the inhabitants of which are engaged in navigation, fishing, and making woollen stockings. *Femern* is about 16 miles long and 12 broad, the area 63 square miles, and the population 8200. This island contains the towns of Burg, Romöe, and Sylt, the inhabitants of which are similarly occupied to those of Föhr. *Nordstrand* was a large island, which was visited by a dreadful inundation on the 11th of October, 1634, when 6408 persons and 50,000 head of cattle perished, and the island was broken into fragments, of which only two, Nordstrand and Pellworm, have been secured by dykes. Between these larger islands there are many small ones, without dykes, the construction of which would be too expensive. They are inhabited by descendants of the Frieslanders.

Schleswig, the chief town of the duchy, is situated in 54° 30′ N. lat., and 9° 35′ E. long., in a pleasant country at the mouth of the river Sley, which forms a small shallow bay obstructed by sand-banks. It is a long irregularly-built town. The houses are mostly of brick, and resemble in neatness those of a Dutch town. The principal public buildings are the cathedral and other churches, the town-house, the orphan asylum, the poor-house, and the nunnery of St. John. The population is about 12,000. There are manufactures of china, earthenware, lace, cambrics, thread, leather, sailcloth, woollens, starch, and refined sugar.

Besides Schleswig, Apenrade, and Flensburg, the following are the most considerable towns in the duchy:—*Eckernforde*, with 3500 inhabitants, has a good harbour, and a trade in corn with England. *Friedrichstadt* on the Eider, a well-built town, founded by Dutch settlers, has 3000 inhabitants, who have manufactures of silk, cotton, hosiery, starch, and lackered wares. *Hüsum*, on the Aue, with 4500 inhabitants, has a grammar-school, distilleries of brandy from potatoes, breweries, manufactures of leather and tobacco, and a considerable trade in corn and cattle. *Tondern* or *Tundern*, on the river Widau, has 3600 inhabitants. It has a good port, with a trade in corn and cattle, an oyster-fishery, and manufactures of cotton and lace; the last employs, in the town and the environs several miles round, 10,000 or 12,000 persons. *Tönningen*, a seaport and trading town at the mouth of the Eider, has 2200 inhabitants.

Holstein is situated between 53° 30′ and 54° 24′ N. lat., and 8° 41′ and 11° 2′ E. long. It is bounded N. by Schleswig, E. by the Baltic, W. by the German Ocean, S.E. by Lübeck and Lauenburg, S. by the Elbe (which separates it from Hanover) and the territory of Hamburg. The area is 3311 square miles. The population in 1845 was 479,364, nearly all of the Lutheran religion.

The principal rivers of Holstein are the Elbe, the Stör, the Eider, the Alster, the Bille, the Schwentine, and the Trave. The largest of the lakes is that of Ploen. The country is on the whole fertile, especially in the marsh-lands which border on the German Ocean and the Elbe. The mineral products are, in the vicinity of Oldeslohe, salt, lime, and plaster of Paris, and near the Baltic, amber; but there are no metals. The surface is in many parts strewed with boulder stones. The agricultural products are corn, pulse, potatoes, some hops, flax, and hemp. The breed of horses and of horned cattle is excellent. There are likewise sheep, swine, and abundance of poultry and game. There are no manufactures that need any particular notice. The exports consist of corn, timber, horses, cattle, butter, and turf; the imports, of colonial produce, wines, and manufac-

tures. The herring fishery, and the Greenland whale and sea fishery, are a source of considerable profit. Trade is greatly facilitated by the Holstein or Kiel Canal, made in the years 1777-1784, at the expense of above two millions and a half of dollars, to form a communication between the German Ocean and the Baltic. The principal towns in Holstein are—Kiel, on the Baltic, near the termination of the canal [KIEL]; Altona, the largest town in the Danish dominions, next to Copenhagen [ALTONA]; Rendsburg, on the Eider [RENDSBURG]. *Glückstadt* on the Elbe, half way between Hamburg and the mouth of the river, is a regularly-built town. It was declared a free port in 1830, and has much trade, and several ships engaged in the whale-fishery. *Blankenese* is a large fishing village, beautifully situated on the Elbe, between 6 and 7 miles from Hamburg.

The political struggle at present (1850) carried on in Schleswig and Holstein has arisen chiefly out of disagreements concerning the succession to the sovereign power. Frederick I., duke of Schleswig and Holstein, became King of Denmark in 1523. In 1533 the duchies were united in perpetuity to the Danish crown. Shortly afterwards, a partition of the greater part of the duchies was made by Christian III. between his brothers; this gave rise to innumerable quarrels and struggles, which were not terminated until 1773, when the alienated territory was recovered, and other territories given in exchange for them. The King of Denmark, as Duke of Holstein, is a member of the Germanic Confederation; and it is on this ground that many German states have recently interfered in respect to the politics of the duchies. After the death of Frederick VI. in 1839, a contest arose respecting the succession, as the law of primogeniture was different in the duchies from that which had been established in Denmark. Disagreements gradually arose between Denmark and Germany, and the duchies sided with the latter. In 1846 Christian VIII. made a formal claim of sovereignty over the duchies; Schleswig resisted, and appealed to Germany for support. In February, 1848, the duchies were invited to send deputies to the Danish parliament; but they claimed a separate parliament. In April a provisional government was assembled at Rendsburg; Schleswig voted herself a member of the Germanic Confederation; and the King of Prussia was invited to take part with the duchies. The King consented; and hence have arisen the hostilities and armistices which have succeeded each other for two years. At the present time (April, 1850), the negotiations for a peaceful settlement of the matters in dispute are far from concluded. The Danish parliament has uniformly supported the King of Denmark in his resistance to the claims of the duchies. Christian VIII. was succeeded by Frederick VII. in January, 1848.

The duchy of *Lauenburg* is situated between 52° 22′ and 53° 47′ N. lat., and 10° 3′ and 11° 5′ E. long., on the north bank of the Elbe, which separates it from Hanover. It adjoins Holstein on the S.E. The area is 400 square miles. The population in 1845 was 46,486, chiefly Lutherans. The country is level, and in general fertile, but there are some extensive heaths. The Elbe, the Bille, the Stecknitz, and the Trave, together with the Stecknitz Canal, afford ample means of inland communication. The productions are similar to those of Schleswig and Holstein. Lauenburg had formerly its own dukes. It is now included in the kingdom of Denmark. The chief towns are *Lauenburg*, on the Elbe, at the mouth of the Stecknitz Canal, with a population of about 3500, and *Ratzeburg*, the capital, on an island in the Ratzeburg Lake, with a population of 2500.

SCHMIEDELIA, a genus of plants belonging to the natural order *Sapindaceæ*. *S. serrata* has a small red succulent fruit, which is eaten by the natives of Hindustan. The root is astringent, and is employed by the native practitioners in diarrhœa. *S. Cochinchinensis* is native of Cochin-China, on the banks of rivers. The leaves are used as cataplasms in contusions.

SCHNEEBERG. [ERZGEBIRGISCHE KREIS.]

SCHNEIDER, CONRAD VICTOR, was born at Bitterfield in Saxony, in 1610, and died in 1680 at Würtemberg, where he had been for many years professor of medicine and physician to the elector. His works are very numerous: the most important is that entitled 'De Catarrhis' (Wittenb., 1660), which consists of six books, devoted chiefly to an anatomical description of the cavities of the nose, and to the refutation of the generally received opinion that the mucus in a catarrh flows from the brain through apertures in the ethmoid bone into the nose and to the fauces. The name Schneiderian membrane has been since appropriated to that lining of the cavities of the nose, of which he was the first to describe the structure and some of the functions.

SCHNEIDER, JOHANN GOTTLIEB, was born on the 18th of January, 1750, near Wurzen in Saxony, of poor parents. At the age of eighteen an uncle sent him to the University of Leipzig to study law; but his taste was for philosophy, to which he devoted himself. His first work, 'Notes on Anacreon,' was published at Leipzig in 1770. After staying some time at Göttingen, he went to Strassburg and assisted Brunck in his edition of the Greek poets. He spent three years at Strassburg, when he paid some attention to anatomy, zoology, and botany. Conjointly with Brunck he published an edition of Oppian's Poems, 1776, 8vo, and a collection of the fragments of Pindar. In this year he accepted the professorship of philology and eloquence at the University of Frankfort on the Oder; and when the university was removed to Breslau in 1811, he followed it and held the same chair. In 1816 on the death of Bredow, Schneider gave up his professorship and accepted Bredow's place of chief librarian. He died on the 13th of January, 1822. Schneider did not set much value on the university lectures, and he encouraged his pupils to private study, in which he gave them an excellent example.

Schneider has deservedly a high reputation as a scholar. As a verbal critic, though not among the first, he held a respectable place; but he was well acquainted with many subjects by which the writings of antiquity may be illustrated, of which

scholars generally are ignorant. Among his numerous works are an edition of Aelian 'On Animals,' Greek and Latin, Leipzig, 1784, 2 vols., 8vo; an edition of Xenophon; an edition of Aristotle's work 'On Animals,' Leipzig, 1812, 4 vols., 8vo; and an edition of the Latin 'Scriptores Rei Rusticæ,' 4 vols., 8vo. In 1797 he published the first edition of his 'Greek Dictionary,' of which a third edition appeared in 1820, 2 vols., 4to, with a supplement published in the following year. This book is the foundation of Passow's Greek Lexicon. These are only some of his many learned labours. His German works on natural history and his short essays on various subjects are very numerous.

SCHNURRER, CHRISTIAN FRIEDRICH, was born October 28, 1742, at Canstadt in Würtemberg. After studying at Tübingen, he went to Göttingen, and also visited Holland, England, and France. In 1770 he was appointed professor of philosophy at Tübingen, where he subsequently lectured on the Greek and Oriental languages. In 1805 he was appointed chancellor of the university. After the French were driven from Germany, Schnurrer became a member of the Chamber of Deputies in Würtemberg, and was always an advocate of liberal principles. He died Nov. 10, 1822.

Schnurrer was a man of great and accurate learning, especially in Oriental literature, but his official duties prevented him from producing many great works. His numerous writings are mostly small dissertations on historical and theological subjects, written on various occasions and in programs. His 'Bibliotheca Arabica,' the last edition of which appeared at Halle, 1811, is a work of great learning.

SCHÖEN or SCHONGAUER, MARTIN, was, according to recent discoveries, born at Ulm of a family which produced many artists in the early part of the 15th century. His name occurs in Ulm documents from 1441 to 1461. He settled about 1461 in Colmar, and died there in 1485 or 1486.

Martin appears to have been chiefly an engraver in his youth, and to have devoted his attention to painting after a visit to the Netherlands, where he became acquainted with the works of the Van Eycks and their scholars. He probably resided some time at Antwerp, and it is supposed that he studied under Roger van Bruges.

The best works of Martin Schön are still at Colmar in the college library, but there are many which are attributed to him in the collections of Munich, Vienna, Nürnberg, and Schleissheim, and in other places, as Ulm, Stuttgardt, Basel, Berlin, &c. None of his pictures are signed with either a name or monogram, but his prints are generally marked with a monogram.

Schön's prints, though crude in light and shade, are among the very best of the early productions of the Germans in this class. Bartsch enumerates and describes 116.

SCHŒNANTHUS. [SPIKENARD.]

SCHOENUS, a genus of plants belonging to the natural order *Cyperaceæ*. *S. myricans* is found on turfy bogs in Great Britain.

SCHŒPFIA, a small genus of the natural family of *Loranthaceæ*, is found in the West Indies and in the Andes of Peru, also in Lower Assam, and in Nepaul.

SCHÖFFER, PETER, one of the inventors of printing, was a native of Gernsheim in Darmstadt. In early life he followed the trade of a copyist at Paris; but, about 1450, removed to Mainz, and got employment in the printing-office recently established there by Gutenberg and Fust. Upon the dissolution of their partnership, he joined Fust as a principal, and by inventing the punch, gave completion to the discovery of printing. He afterwards married Fust's daughter.

Schöffer's name first appears with Fust's at the end of the Psalter of 1457, and they continued to print jointly till Fust's death in 1466. [FUST.]

The list of books printed by Schöffer alone after Fust's death is a long one. It will be found in Panzer's 'Annals,' vol. ii., 4to., Norimb., 1794, p. 117–136, with an enumeration of other works known as his by the type, but without his name.

The following were printed by him previous to 1470, namely, the 'Secunda Secundæ' of S. Thomas Aquinas; and the second edition of the 'Constitutions of Clement V.,' 1467; the 'Institutions of Justinian,' 1468; St. Thomas Aquinas's 'Commentary on Peter Lombard,' fol., 1469; and the second edition of the 'Sixth Book of the Decretals of Pope Boniface VIII.'

His last work of all was a Latin Psalter, fol., 1502; in which year he is supposed to have died, leaving behind him John Schöffer his son, whose name appears alone as the printer of 'Mercurius Trismegistus,' in 1503, and of many subsequent works.

SCHOLIUM (Σχόλιον) is a name given in the older mathematical writers to the remarks which follow a proposition. A scholium must be distinguished from a corollary, inasmuch as a corollary necessarily contains some deduction from the demonstration which precedes, which is not the case with a scholium. A scholium is a sort of appendix, containing general remarks upon the scope of a proposition, its application, or its history; everything in short which is not an absolute corollary. The word is used by Cicero ('Ep. ad. Att.,' xvi. 7) in its general sense of remark, commentary, or explanation.

SCHOMBERG, ARMAND FREDERIC DE, was born in or about 1619. Bred a soldier, he began his career in the Swedish army during the Thirty Years' War. He next entered the service of the Netherlands, and afterwards that of France, in which, from 1650 to 1685, he led an active and distinguished life, and rose to the rank of marshal. In 1685, the revocation of the Edict of Nantes drove him to seek liberty of conscience in another country; and he betook himself first to the service of Portugal, then to that of the Elector of Brandenburg, and lastly to that of the Prince of Orange, when about to make his descent upon England in 1688. Schomberg was sent to Ireland in 1689, as commander-in-chief; where, during ten months, his successes fell short of the expectation raised by his high reputation. He was killed, July 1, 1690, at the battle of the Boyne.

SCHÖNBURG is a part of the kingdom of Saxony, consisting of the possessions of the ancient house of Schönburg, situated between the circles of the Erzgebirge, Leipzig, and Meissen, and the principality of Altenburg. The family of Schönburg is now divided into two principal lines, that of the princes of Schönburg-Waldenburg, and that of the counts of Schönburg-Penig, which is again subdivided into two branches. The territories of the whole are 345 square miles in extent, with about 120,000 inhabitants. The country is mountainous, but very fertile, producing corn, timber, flax, fruit, potters'-clay, cinnabar, and slate. The inhabitants are very industrious, and, besides their agricultural occupations, have considerable manufactures of linen, woollen, cotton, paper, and earthenware. The chief towns are—*Waldenburg*, on the Mulda, with 4800 inhabitants; and *Glauchau*, also on the Mulda, with 6400 inhabitants.

SCHÖNEBECK. [Magdeburg.]

SCHOOLS. A school is a general name for any place of instruction. There are schools for young Children, called Infant Schools; schools for children of more advanced age; schools for very poor children, called Ragged Schools; and schools for the higher branches of learning, as Grammar Schools, Colleges, and Universities. There are also schools for special branches of knowledge, as schools for Agriculture, Medicine, Theology, Law, for the Blind, the Deaf and Dumb, and so forth.

The school systems of all nations have something peculiar; and the peculiarities are closely connected with the political system of each country. A good system of schools of all kinds suited to the wants of a political community perhaps exists in no country, though some of the German states have perhaps approached nearer to establishing such a system than any other countries. There are two modes in which good schools may be established: a government may make the whole school system a part of administration, and leave very little to individual enterprise and competition; or the establishment of schools of all kinds may be left nearly altogether to individual enterprise. Perhaps in no country has either the one or the other mode been altogether followed. Prussia is an instance in which the government has apparently done most in the way of directing the establishment and management of schools; and in England, of all countries which have attained a high degree of wealth and power in modern times, the government has perhaps done the least, though perhaps in no country have benevolent individuals and associations of individuals contributed so largely to the establishment of permanent places of education. England is also the country in which there are most schools kept by individuals for the object of private profit; and the United States of North America are perhaps the next.

It is impossible to consider a state well organised which shall not, to some degree and in some manner, superintend all places for education. It is equally impossible to view education as well organised in a state, if all competition shall be excluded from the system; and in fact there is no country, not even those in which education is most directly made a branch of administration, in which some competition of some kind does not exist. In fact, if it does not exist in some form and in some degree, there will be no efficient instruction.

SCHOONER. [Ship.]

SCHOONHOVEN. [Holland.]

SCHOREL, or SCHOREEL, JOHN, was born in 1495, at Schorel, a village near Alkmaar in Holland. He was placed at the age of fourteen under William Cornelis, an indifferent painter, and afterwards studied under James Cornelis at Amsterdam, and John de Mabuse at Utrecht. He then travelled through Germany, and passed some time at Nürnberg with Albert Dürer. He next went to Venice, where he was persuaded to join a company of pilgrims to the Holy Land. In Palestine, at Rhodes, and at Cyprus, he made numerous sketches. On returning to Europe he passed three years at Rome, studying the works of Raphael and other great masters and the antique. He was the first of the artists of the Netherlands who introduced the Italian taste into his own country. He settled at Utrecht. His works were very numerous, and are spoken of in the highest terms of praise. Unfortunately all his great works in the churches and convents were destroyed by the Iconoclasts, in 1566. In the gallery at Munich are four of his pictures; and in Lord Methuen's gallery at Corsham House there is one, of which Dr. Waagen speaks very highly. Schorel died at Utrecht in 1562.

SCHOTT, ANDREW, was born on the 12th of September, 1552, at Antwerp. He studied at Louvain, where he afterwards taught rhetoric. After spending two years in France, he visited Spain, and was successively professor of Greek at Toledo and Saragossa. In 1586 he entered the order of Jesuits, and taught theology, until he was invited to Rome as professor of rhetoric in the college of the Jesuits. After staying at Rome three years, he returned to Antwerp, where he died on the 23rd of January, 1629. Schott was a most industrious scholar, and a man of learning. His works are said to be forty-seven. A list of the principal of them is given in the 'Penny Cyclopædia,' article 'Schott, Andrew.' He was the editor of the 'Annales Romani' of Pighius, with additions.

SCHOUTEN ISLAND. [Van Diemen's Land.]

SCHREVE'LIUS, CORNELIUS, was born at Haarlem in South Holland, about 1615. His name is familiar as the editor of various Greek and Latin authors, but he is chiefly known by his small Dictionary of the Greek language, a work that may have deserved some credit at the time of its appearance. This work has been often reprinted, and has been published in Greek and English, with some of the old errors corrected and new ones added. The student is warned against the use of a book, which will be an impediment to his acquiring a correct knowledge of the Greek language.

SCHULTENS, ALBERT, born at Groningen, in 1680, studied theology and the Oriental languages there till 1706. He afterwards studied

at Leyden, and then at Utrecht under Reland. On his return to Groningen in 1708, Schultens took holy orders. He was successively professor of Oriental languages at Franeker and Leyden, where he died in January, 1750. He left a son, named John Jacob, who was professor of divinity at Herborn, and who succeeded him in the chair of Oriental languages at Leyden. Schultens published several works on subjects connected with Biblical or Oriental literature. His version of Job and the commentary are in 2 vols. 4to.

SCHULTENS, HENRY ALBERT, grandson of the preceding, was born at Herborn, Feb. 15, 1749, when his father (John Jacob) was professor of divinity there. He was educated at Leyden, where he applied himself with great diligence to the study of Hebrew and Arabic. He also studied the Greek and Latin classics under Hemsterhuis, Rhunkenius, and Walkenaar, and cultivated English literature, being remarkably fond of Pope and an enthusiastic admirer of Shakspere. In 1772 he published his 'Anthologia Sententiarum Arabicarum' (Leyden, 4to.) with a Latin translation and notes. Shortly after he visited England, for the purpose of consulting the Arabic MSS. in the Bodleian Library, and resided for some time at Oxford. During his stay in England, Schultens published his 'Specimen Proverbiorum Meidani ex Versione Pocockianâ' (1773, 4to.), which he had transcribed while at Oxford from the original manuscript of Edward Pocock in the Bodleian. On his return to Holland, Schultens was appointed professor of Oriental languages in the academical school of Amsterdam, where he remained for five years, until, in December, 1778, he was called to succeed his father in his chair, and in 1787 was elected rector of the university. He died in August, 1793.

SCHULTING, ANTONIUS, was born at Nymegen in Guelderland, in 1659. He received a learned education under Rycquius and Grævius, and afterwards studied law at Leyden under Voet and Noodt. After being a teacher of law in his native province and also in Friesland, he was removed to the University of Leyden in 1713, where he became the colleague of Noodt. He died at Leyden in 1734. Schulting had a right perception of the necessity of studying Roman law in its historical development. One of his best works is the 'Jurisprudentia Vetus ante Justinianea,' Leyden, 1717, and Leipzig, 1737, which contains the remains of the four books of the 'Institutiones' of Gaius, as they were then known, the 'Sententiæ Receptæ' of Paulus, the twenty-nine 'Tituli ex Corpore Ulpiani,' the fragments of the 'Codices Gregorianus et Hermogenianus,' the 'Mosaicarum et Romanarum Legum Collatio,' and some few other matters.

SCHWABACH. [Rezat.]

SCHWANTHALER, LUDWIG MICHAEL, was born at Munich in 1802. He was educated at the gymnasium of Munich, and while yet a youth read Homer and the Greek tragedians; but in order to devote himself wholly to art he quitted the gymnasium in 1818 to enter the workshop of his father, who was a sculptor, a profession which had been followed by the family for several generations. While working under his father he studied also at the Academy of Arts in Munich, where, it is said, he received little encouragement, as the boldness and originality of his ideas were above the comprehension and offensive to the prejudices of Langer, at that time director of the Academy, who was a pedantic follower of the formal school. Schwanthaler, in opposition to Langer's opinions, studied the antique, and attended the lectures on archæology by Thiersch. On the death of his father, in 1821, Schwanthaler succeeded to his business, and in 1824 received his first important commission, the sculpture of a border round a magnificent epergne, for King Maximilian; this border was to have been 100 feet in length, and the figures 6 inches high. The subject chosen was the Procession of the Gods to the Palace of Jupiter on Olympus, but the death of the king prevented the completion of the work, though report speaks highly of the portion that was done. In 1826 Schwanthaler paid a short visit to Rome, and on his return he was employed by King Ludwig to execute for the Glyptothek two subjects in relief, Achilles fighting in the Scamander, and the battle at the ships between the Greeks and Trojans; and also a statue of Shakspere for the hall of the theatre. Duke Maximilian, the king's brother, likewise employed him on a frieze for the dining hall of his palace at Munich, the subject being the mythological history of Bacchus. In 1832, under the patronage of the king, Schwanthaler again visited Rome, in order to study and prepare models for the pediments of the Walhalla, for which the king had given him a commission. He remained in Rome two years, and prepared models as sketches for the statues of the sculptors and painters which he afterwards executed, together with the cartoons for the painted friezes in the royal palace, the subjects of which were taken from the legend of Orpheus and from Hesiod. He also made sketches for pictures from Æschylus, Sophocles, and Aristophanes. On his return to Munich he was incessantly employed, and in 1835 he was appointed professor in the Academy. Though suffering from attacks of gout, he, among various other things about this period, furnished the model for the twenty-four statues of painters in the attic of the Pinakothek, in a size larger than life, the execution of which was distributed among several sculptors; and the models also of Christ and the Evangelists for the front of the Ludwigskirche. Among the almost innumerable products of Schwanthaler's genius and industry, it will only be necessary to enumerate a few of the more important. The rilievo for the Barbarossa saloon in the royal palace, 200 feet long, representing scenes in the crusade of that monarch, a most excellent specimen of composition and expression in the romantic style; models for the twelve ancestors of the house of Wittelsbach, afterwards executed in bronze by Stiglmayer; the fifteen colossal statues on the front or southern pediment of the Walhalla; the models for the fifteen statues representing the victory of Hermann, on the northern pediment; the model, 54 feet high, for the colossal statue of Bavaria; the pediment of

the Kunstaustellungs-Gebäudes (Exhibition of Arts and Industry); the model for the colossal monument in bronze for the Grand-Dukes Ludwig of Hesse and Karl Friedrich of Baden; and a series of designs from events in the war for the liberation of Greece from the Turks, for the royal palace at Athens. A commission from Bohemia for a series of statues of Czech heroes and heroines was interrupted by his death.

Schwanthaler also either executed or furnished models for monuments or statues to Frauenlob, the ancient poet, at Mainz; of the Emperor Rudolf, at Speier; of Jean Paul (Richter); of Mozart, at Salzburg; and for Göthe, at Frankfort-on-the-Main. Among his classical works, we may distinguish—the shield of Hercules, from Hesiod, which was partly executed by his pupils Balbach and Puille; eight statues of gods and two female dancers, in the castle of Wiesbaden; and a marble group of Ceres and Proserpina in Berlin. After a life of unwearied industry he died November 14, 1848.

SCHWARZ, CHRISTIAN FRIEDRICH, was born Oct. 26, 1726, at Sonnenburg, in Prussian Brandenburg. In his twentieth year he entered the University of Halle, where he was appointed to learn the Tamul, in order to superintend the printing of a Bible in that language, which however was not carried into effect; but the knowledge of the Tamul which Schwarz had acquired caused a proposal to be made to him by the Danish Missionary Society that he should take orders and go to India as a missionary. He accepted the proposal, went to Copenhagen, where he was ordained, and reached Tranquebar, on the Coromandel Coast, in July, 1750.

Schwarz continued to labour with the Danish mission till 1766, when he transferred his services to the London Society for Promoting Christian Knowledge. He now took up his abode at Trichinopoly, where he had founded a church and school in 1765. Small congregations of Hindoo converts gradually grew up under his care, and in 1777 another missionary was sent from Tranquebar to assist him. He next obtained permission to build a church in Tanjore. He proceeded with the work till his funds were exhausted, when he applied to the presidency of Madras for assistance. In reply he was requested to proceed immediately to the seat of government in order to receive the appointment of ambassador, for the purpose of treating with Hyder Ali for the continuance of peace, a task to which he was summoned by Hyder himself, who had declared that he would trust no one else. Schwarz was startled by the novelty of the proposal, but proceeded to Seringapatam, and resided at the court of Hyder for three months. His mission was successful; the terms of the peace were settled, and he returned to Tanjore.

The peace however was of short continuance, and Schwarz complained that the British were guilty of the infraction. Hyder invaded the Carnatic, and during the years 1781, 1782, and 1783, the sufferings of the inhabitants were dreadful. In 1784 the East India government sent Schwarz on a mission to Tippoo Saib, but the son of Hyder would not receive him. Another church was built in the neighbourhood of Tanjore, which the increase of his congregation had rendered necessary; and in 1785 he engaged in a scheme for the establishment of schools throughout the country for the purpose of teaching the natives the English language. These proved highly beneficial, not only from the instruction and moral principles communicated, but from the confidence and good feeling which were created in the natives generally.

In 1787 the Raja of Tanjore on his deathbed committed his successor to the care of Schwarz; but it required all Schwarz's influence with the East India Company to establish the young prince in the possession of his inheritance. Schwarz died February 13, 1798.

SCHWARZBURG is a German principality consisting of two considerable portions detached from each other, of which the southernmost is called the Upper County and the northernmost the Lower County. The Upper County lies on the north side of the Thüringer Wald, between 50° 34′ and 50° 55′ N. lat., and between 10° 50′ and 11° 20′ E. long. It is bounded by the Prussian territory and the Saxon duchies, and is traversed by the rivers Gera, Saale, Ilm, and Schwarze. The Lower County lies between 51° 13′ and 51° 25′ N. lat., and between 10° 30′ and 10° 17′ E. long. It is almost surrounded by the Prussian territories, but on the south-west it borders on Gotha, and on the south-east on Weimar. It is watered by the rivers Wipper and Helbe. The total area of the two counties is 745 square miles, and the number of inhabitants in 1846 was 127,393, who are of the Protestant religion, except a few Roman Catholics and Jews. The surface of the country is diversified with mountains, valleys, and plains, and is on the whole fertile. The mineral productions are very varied.

The family of the princes of Schwarzburg is very ancient, and is mentioned in the earliest period of the middle ages. It is now divided into two branches, Rudolstadt and Sonderhausen, each of which has a part both of the Upper and the Lower County.

Schwarzburg-Rudolstadt has a territory of 400 square miles, with a population of 68,711; viz. 54,075 in the lordship of Rudolstadt in the Upper County, and 14,636 in that of Frankenhausen in the Lower County. *Rudolstadt*, the capital, is a well-built town, in a valley on the Saale, and contains 4500 inhabitants. *Frankenhausen*, on an arm of the Wipper, is a walled town, and contains about 5000 inhabitants.

Schwarzburg-Sonderhausen has a territory of 345 square miles, and 58,682 inhabitants; viz. 33,250 in the lordship of Sonderhausen in the Lower County, and 25,432 in that of Armstadt in the Upper County. *Sonderhausen*, situated in a valley on the Wipper, contains a palace, theatre, gymnasium, and about 4500 inhabitants. *Armstadt* contains also a palace, 4 churches, and 5400 inhabitants.

SCHWARZWALD. [BADEN.]

SCHWARZWALD, one of the four circles of the kingdom of Würtemberg, derives its name from the principal range of mountains, the

Schwarzwald, or Black Forest. It is situated between 47° 55′ and 48° 55′ N. lat., and between 8° 15′ and 9° 15′ E. long. The face of the country is mountainous and woody. The Black Forest covers all the western part. Timber, cattle, game, fish, and minerals, are abundant; but the soil is not suited for agriculture.

The country-people spin yarn, thread, and worsted, and manufacture ticking, worsted stockings, caps, and muslin; and there are larger manufactures of leather, paper, oil, clocks, glass, iron, wooden wares, and chemicals. The circle is divided into seventeen bailiwicks. The chief towns are—*Calw*, a busy place with about 4500 inhabitants; REUTLINGEN; *Rothenburg*, on the Neckar, with broad streets, 6 Roman Catholic churches, and 6000 inhabitants; and TÜBINGEN.

SCHWEDT. [BRANDENBURG.]

SCHWEIDNITZ. [SILESIA.]

SCHWEITZ. [SWITZERLAND.]

SCHWERIN. [MECKLENBURG.]

SCHWYZ, one of the cantons of the Swiss confederation, which has given its name to all Switzerland, called 'Schweiz' in German. The canton lies on the west side of the high Alps of Glarus. It consists of several long valleys between lower offsets of the Alps, the summits of which are from 4000 to 6000 feet high, and of a plateau or table-land in the centre of the canton. The principal valleys are the Wäggi Thal in the north, the Sihl Thal in the middle, and the Muota Thal in the south. The waters of the northern part of the canton of Schwyz run in a north direction into the lake of Zürich; those of the central part flow northwards by the river Sihl into the Limmat; and those of the southern part run southwards into the Waldstätter Lake. Besides bordering on those two lakes, the canton embraces within its territory the southern part of the lake of Zug, and it also entirely encloses the small lake of Lowerz. North-west of the lake of Lowerz, and between it and the lake of Zug, is the valley of Goldau, between Mount Rigi and the Rossberg.

Schwyz is bounded by the cantons of Glarus, St. Gall, Zug, Luzern, Unterwalden, and Uri. The area is 338 square miles. The population in 1837 was 40,650.

None of the mountains of Schwyz being covered with perpetual snow, the cold is not so severe as in the other alpine valleys, and the cattle are able to feed in summer as far as the summits. The farming produce is considerable. The manufactures consist chiefly of linens, potash, soap, walnut-oil, wax candles, tobacco, and gunpowder. There are also some breweries, and many saw-mills, and lime and brick kilns.

The canton contains six towns, twenty-six villages forming parishes, and fifty-eight hamlets. The various communes contain elementary schools; and there are a few schools of a higher grade. The language of the people of Schwyz is a Swiss-German dialect, which differs little from that of Zürich; it is full of guttural sounds, and the people accentuate the words strongly.

Schwyz, the capital of the canton, is situated near the Waldstätter Lake. It is an open town: it has two good streets, a large square, a very handsome church, two or three convents, a town-house, an hospital, which serves also as a prison, a library belonging to the town, which is rich in works relative to the history of the country, a cabinet of medals, several good inns, and about 4000 inhabitants. The town of *Einsiedeln*, situated about 10 miles north from Schwyz, is a thriving place, with a paved street, numerous shops, inns, and public-houses, and about 2500 inhabitants. The prosperity of Einsiedeln is owing to its celebrated sanctuary in the church of the abbey, which attracts 150,000 pilgrims every year. *Gersau*, a small flourishing town on the shore of the Waldstätter Lake, was formerly a distinct republic, the smallest in Europe, with a population of about 1300 inhabitants, but it is now united to the canton of Schwyz. *Lachen*, on the south shore of the lake of Zürich, has a handsome church, a town-house, some iron forges, several mills, and about 1500 inhabitants. *Arth*, a pretty little town at the south extremity of the lake of Zug, has a good parish church, a library in the Capuchin convent, and about 1300 inhabitants.

The canton of Schwyz is divided into seven districts:—1, Schwyz Proper, which is by far the largest, and contains nearly one-half of the whole population of the canton; 2, Einsiedeln; 3, Gersau; 4, The March; 5, Küssnacht; 6, Wolrau; 7, Pfäffikon. Formerly the district of Schwyz Proper, or 'alte landschaft,' was sovereign of the rest, the other districts having no voice in the landsgemeinde, or legislative assembly of the canton, although they had their own respective assemblies and councils and magistrates, subordinate however to the cantonal authorities of old Schwyz. In 1833 a new constitution was framed upon the basis of political equality. The number of persons who form part of the administration is disproportionately great; there is a multiplicity of councils and authorities of every sort; but the public officers either receive very small salaries or are altogether unpaid.

SCIA'TICA is a name often applied to all rheumatic affections about the hip-joint and the back of the thigh, but which is more properly adapted to a disease of the sciatic nerve, either inflammatory, or similar in its nature to those which in other parts are designated *Neuralgia*, or *Tic Douloureux*.

SCIENCE. The word *scientia*, in real Latin, simply means knowledge, and we must attribute the subsequent application of the word to particular kinds of knowledge, to causes similar to those which have influenced the use of the equally general term *Mathematics*. It does not appear that in the earlier parts of the middle ages *science* had any distinct meaning as opposed either to *literature* or to *art*. Almost at the earliest establishment of universities the great preliminary branches of knowledge were separated from the rest under the name of *liberal arts*: that is to say, the Trivium, containing grammar, logic, and rhetoric; and the Quadrivium, containing arithmetic, geometry, astronomy, and music. If theology, law, and medicine were called sciences, it was not in any distinctive sense, and we are inclined to think that *scientia* must then have been

rather a term subaltern to art than opposed to it. How the word grew it is not our business to inquire closely; but by the middle of the 16th century the word *science* had begun to appear as denoting connected and demonstrated knowledge, in opposition to *art*, which signified digested rules of operation not connected with each other by deduction from common first principles. Thus Tartalea, a writer on algebra (which was then, and most properly, called only an *art*, ars magna, or arte maggiore), styles Euclid, in the preface to his edition of the Elements, '.the sole guide to the mathematical *sciences*.' By the middle of the 17th century, the term science was freely used in the sense which it has never since lost, namely, that in which it is opposed to literature.

Science, as opposed to literature, means any branch of knowledge in which the properties of mind or matter are to be made the subject of reasoning, with a view to discover and apply first principles.

By science, in popular language, is meant simply mathematical, physical, or natural science, not with reference to principles, but to results. Calculation, collection of natural objects, construction of models, use of philosophical instruments, any or either, is science, or part of science; and a man of science (man of *a* science, or man of the art which is built upon *a* science, would frequently be a correct description) may be either a mathematician, mechanist, engineer, medical practitioner, astronomer, geologist, electrician, zoologist, ornithologist, &c. When the word science comes to be used in its high and proper sense, indicative of truth discovered, error prevented, inquiry organised, judicious habits formed, and mental energy strengthened, it must be difficult for those who are used to the common sense of the word to imagine the truth of many things which are said about it. ' All we require is, that he will hold his former opinions and judgments without bigotry, retain till he shall see reason to question them, be ready to resign them when fairly proved untenable, and to doubt them when the weight of probability is shown to lie against them. If he refuse this, he is *incapable of science*.' Now this, though the word of a good authority, and perfectly true, is nevertheless notoriously false in the common sense of the word science : a man may be incapable of the preceding state of mind, and may be a man of science. There is no remedy for this confusion of terms, except that which every one must make for himself, by attention to the different senses of the word, the higher and the lower.

SCIENOIDES, a family of Acanthopterygious osseous fishes, of which the genus *Sciaena* is the type. They are closely allied to the perches, and resemble them in their general characters, but differ in having no teeth on the vomer and palatines. The preopercle is denticulated; the opercle is armed with spines; the bones of the face and head are often cavernous, forming a protruding snout.

The *Scienoides* are divided into those having two dorsal fins, and such as have only one. In the first section we find the genus *Sciaena*, of which a single species, the Maigre, *Sciaena aquila*, occasionally wanders from the seas of Southern Europe into our own. *Haemulon*, *Pristoma*, *Diagramma*, and *Amphiprion* are among the many genera belonging to the second section.

SCILLITIN, the bitter principle of Squills (*Scilla maritima*), is colourless, friable, of a bitter taste at first, and afterwards nauseous and sweetish, and attracts moisture from the air. It is soluble in alcohol and in æther; its solution is not precipitated by acetate of lead. It is emetic and purgative, and when it is very pure may occasion death.

SCILLA, or *Squilla maritima*, or Sea-Onion, is a plant common on the sandy shores of the Mediterranean, Portugal, and the Levant. It is imported into Britain from Malta and other parts of the Mediterranean, and also from St. Petersburg and Copenhagen. The officinal part is the bulb, of which there are two varieties : the one large and whitish externally; the other smaller, of a brownish-red colour. The former is preferred in England, the latter in Germany. The bulb abounds in an acrid mucilaginous juice, with an alliaceous odour, and a bitter acrid nauseous taste. It is imported whole, or cut in slices and dried.

Squill in a large dose is unquestionably poisonous, but in many cases it fortunately acts as its own antidote, by causing vomiting. But even in a moderate dose it may still do much harm, by its stimulating effect, if prematurely employed, as it often is, as a popular or domestic medicine in the early stages of colds and coughs. It is for the second stage alone of these that it is suited. It augments the secretion from most mucous surfaces, and also stimulates the kidneys, and sometimes the skin.

SCILLY ISLANDS, a remarkable group of islands lying off the Land's End in Cornwall; they are comprehended between 49° 51′ and 50° N. lat., and between 6° 11′ and 6° 30′ W. long. The lighthouse on St. Agnes, one of the southernmost of the group, is in 49° 53′ 38″ N. lat. and 6° 19′ 23″ W. long. The area of the whole is about 5570 acres, or somewhat less than 9 square miles.

It is believed that the Scilly Islands were at some remote period part of the mainland of Cornwall, and were dissevered by the action of the sea. There are more than 140 islands; but a large part of them are uninhabited. Those which exceed 100 acres each in extent are St. Mary's, Tresco, St. Martin's, St. Agnes, Bryher, and Samson. The islands form a compact group, surrounded by a deep sea, from which they rise for the most part abruptly, with rugged sides. In the channels which separate the islands the depth of the sea is much less; and in several parts extensive flats, some of them dry at low water, and others covered with water only knee deep, extend from island to island. The islands and rocks consist almost entirely of granite. The climate is mild, but subject to sudden storms.

St. Mary's, the most important island, is about 2½ miles long by 1½ broad. It consists of two portions, the smaller of which, called 'the Hugh,' is united to the other part by a low sandy isthmus,

on which stands Hugh Town, the principal place in the island. The soil is generally good; about one-half of it is in cultivation, and produces luxuriant crops of corn and potatoes. Hugh Town consists of one principal street, very crooked, and of several lanes, alleys, and courts: the houses, which are chiefly built of stone procured in the neighbourhood, are small and irregular; there are a few public buildings and a pier extending into St. Mary's Pool. The Hugh is a steep hill rising about 110 feet above the level of the sea, fortified by lines having a circuit of more than a mile, with eighteen bastions or batteries, and enclosing a small fort called Star Castle, and barracks for the officers and troops. The population in 1841 was 1545.

Tresco, the island next in importance, is inhabited chiefly by pilots and fishermen. Population, 430.

St. Martin's, about 2 miles long by 1 broad, is chiefly inhabited by pilots and fishermen. Population, 214.

St. Agnes consists of two parts, St. Agnes Proper and the Gugh, separated from each other at high water, but connected, when the tide is out, by a narrow neck or isthmus of sand. There is a substantial lighthouse on this island. Population, 243.

Bryher consists of several steep hills connected by tracts of low land. Population, 121.

Samson is united with Bryher and Tresco by flats fordable at low water. Population, 29.

The natural produce of the Scilly Islands consists of a thin short grass intermixed with chamomile, heath, and dwarf furze: fern and moss are found near the shore. Among the cultivated produce are potatoes, wheat, rye, and garlic. There are horses, cattle, sheep, and pigs. Game and poultry are less numerous than formerly.

The Scilly Islands belong to the duchy of Cornwall. A military commandant at St. Mary's and a collector of the customs are appointed by the authorities in London. The islands are considered to be in the diocese of Exeter. The tithes of the islands belong to the duchy of Cornwall.

The Scilly Islands are generally considered to have been the Καττιτερίδες or Κασσιτερίδες (Cassiterides) of the Greeks. [CASSITERIDES.] Mr. Woodley supposes these islands to be the Œstrymnides of Festus Avienus ('Ora Maritima,' 94, et seq.) The conquest of South Britain by the Romans must have led to the discovery of the proximity of the Cassiterides to Britain, if not of their identity with it. From the time of the Romans, who used them occasionally as a place of banishment, there is no notice of the islands in history until their conquest by Athelstan, king of England, who expelled the Danes about A.D. 938. Of their ancient importance these islands retain little trace. There are some Druidical monuments.

SCINA', DOME'NICO, born at Palermo in 1765, studied in his native town under Rosario Gregorio and other masters, and became a proficient in classical erudition. He afterwards applied himself to the study of the mathematical and physical sciences. In 1796 he was appointed Professor of Physics in the University of Palermo. He was sent by the government to Sicily to explore the natural phenomena of the island and he published the results of his observations. He gave an account of the eruption of Ætna of 1811, in two letters: 'Lettere scritte da Catania à Monsignor Grano in Messina.' He wrote on the currents of the straits of Messina: 'Memoria sù i Fili Reflui, e i Vortici apparenti dello Stretto di Messina.' In 1818 he published a 'Topografia di Palermo e de' suoi Contorni,' in which he describes the physical geography of the tract, its geological and mineral formation, its vegetable and animal productions, and its meteorology, accompanied by a map. In 1819 he was sent to explore the mountainous group called Monti Madonie, the ancient Nebródes, with regard to the earthquakes to which that region is subject, which produced his 'Rapporto del Viaggio alle Madonie, intrapreso per Ordine del Governo,' Palermo, 1819. In 1823 he went on a like mission to the district of Ogliastro, near Termini, where an earthquake had among other damage affected the springs of the mineral waters from which the town takes its name. He wrote two reports on the subject, which were inserted in the Sicilian 'Giornale di Scienze, Lettere, ed Arti.' When a volcanic island arose suddenly off the southern coast of Sicily, Scinà was sent to examine it, and he wrote a 'Breve Ragguaglio del novello Vulcano.' In 1815 Scinà was appointed historiographer of Sicily; in 1822 he was made chancellor of the university of Palermo; in 1823 he was made curator of the public library of Palermo; he also held other offices of profit or dignity, and in 1828 King Francis presented him to the abbacy of S. Angelo di Brolo. Scinà was also the author of several works, among which are—'Introduzione alla Fisica Sperimentale,' 1803, a work which established his reputation as a man of science, and 'Prospetto della Storia Letteraria di Sicilia,' which is one of his most esteemed works.

SCINCOÏDIANS, or LEPIDOSAURS, the names given by Oppel, Fitzinger, and MM. Duméril and Bibron to their last family of *Saurians*.

This family, observe MM. Duméril and Bibron, seems again to establish a sort of connection with or transition to the great division of Serpents, by the intervention of certain species, such as those of *Anguis* and *Acontias*. It is, they remark, a group of Lizards, whose numerous races are found spread over the most arid regions of temperate climates, as well as those where the temperature is always very high.

These *Lepidosaurs*, according to MM. Duméril and Bibron, join to the general character of the Saurians many peculiarities which distinguish them from the seven other families of that order. Thus, their cranium is covered with great plates, joined together at their edges, most frequently angular, whose sutures or lines of junction always remain distinct. Their trunk is completely covered with scales, more or less large and solid, of variable form, but always disposed like a coat of mail, placed quincuncially, and overlapping each other like tiles or slates, nearly like those of the greater part of the osseous fishes. The Scincoïdians have besides the tongue free, fleshy, not of much thick-

ness, slightly notched at the point, and covered totally or partially with scaly papillæ. Their belly is cylindrical, without lateral folds, and covered with scales, having the same disposition, and in general the same form, as those of the back.

All these characters suffice to distinguish the *Scincoïdians* from the whole of the other families. The great angular plates which are applied on the bones of the head and face are never seen in the *Chameleons*, the *Geckos*, the *Crocodiles*, the *Varanians*, nor in the *Iguanians*. They are, it is true, found in the *Lacertians* and in the *Chalcidians*, but the first have always the scales of the belly different from those of the upper part of the trunk, and, in the others, besides the disposition of the horny lamellæ so as to form verticillations or transverse rings, there is most frequently a fold on their sides throughout their length, from the cranium to the origin of the tail.

MM. Duméril and Bibron thus sum up the essential characters of the reptiles which compose the family of the Scincoïdians :—

1. Head covered above by horny plates, which are delicate, angular, and opposed to each other (affrontées) by their faces (pans) in a singular manner.

2. Neck of the same form and size as the breast.

3. Trunk and limbs entirely clothed with imbricated scales, with many faces (pans), most frequently widened, and with the border slightly rounded, disposed quincuncially ; back rounded, without crests or elevated spines; belly cylindrical, without any groove or lateral furrow.

4. Tongue free, flat, without a sheath, slightly notched in front, the surface covered entirely or partially with papillæ, ordinarily all in the form of scales, but occasionally some are squamiform and others filiform.

The above zoologists divide the Scincoïdians into the following subfamilies and genera :—

Subfam. I.—*Les Saurophthalmes.* Genera, *Tropidophorus, Scincus, Sphenops, Dipoglossus, Amphiglossus Gongylus, Eumeces, Euprepes, Plestiodonton, Lygosoma, Leiolopisma, Tropedolopisma* (the last six being accounted subgenera of *Gongylus*), *Cyclodus, Trachysaurus, Heteropus, Campsodactylus, Tetradactylus, Hemiergis, Seps, Heteromeles, Chelomeles, Brachymeles, Brachystopus, Nessia, Evesia, Scelotes, Prœpeditus, Ophiodes, Anguis, Ophiomorus,* and *Acontias.*

Subfam. II.—*Les Ophiophthalmes.* Genera, *Ablepharus, Gymnophthalmus, Lerista, Hysteropus, Lialis.*

Subfam. III.—*Les Typhlophthalmes.* Genera, *Dibamus, Typhline.*

In the first subfamily are comprehended those species which have the eyes resembling those of the majority of reptiles belonging to the Saurian order; they are protected by moveable eyelids capable of closing, the superior being let down, the lower drawn up, so that the eyes can be completely shut. In the second subfamily the eyes are naked, or at most possess only the rudiments of an eyelid, bordering the eye in the form of a circle or half a circle, and generally immoveable; in a species of *Gymnophthalmus* the eyelid is entirely wanting.

The third subfamily of the Scincoïdians comprehends those species which are completely blind, or in which the eyes are so small that they exist in a rudimentary state, entirely covered by the skin, through which they cannot be distinguished. In other blind Saurians, as the *Amphisbœna*, the rudimentary eyes and eyelids are easily perceptible.

The Scincoïdians live upon insects and other small animals. The smoothness of their scales and shortness of their legs enable them to glide easily through small apertures.

MM. Duméril and Bibron give the following interesting account of the geographical distribution of this extensive family. The Scincoïdians are, so to speak, spread over nearly the whole surface of the globe, for they are found in very high latitudes, even in countries where the lowness of the temperature would seem to forbid the existence of Reptiles: such, particularly, is the *Anguis fragilis* [Blindworm], which occurs as far north as Sweden, and perhaps farther. But of all the countries which produce Scincoïdians, Oceania and Australia are those which count the greatest number of species, whilst the Saurians of the other families show themselves in much fewer numbers than in the other parts of the world. The locality of certain Scincoïdian Lizards is far from being limited to any particular country of the globe. Thus *Gongylus ocellatus, Seps chalcides, Anguis fragilis,* and *Ophiomorus miliaris,* live in the south of Europe and in the north of Africa. The *Plestiodon quinquelineatum,* which was believed to be peculiar to North America, is found also in Japan; the *Lygosoma Quoyi, Lygosoma Labillardieri,* and many species of *Eumeces,* are races common to Oceania and Australia; and, what is still more worthy of the attention of naturalists, *Ablepharus Kitaibelii* exists in Hungary, Greece, and Australia, whilst *Ablepharus Peronii* is found in both the last two countries equally, and moreover in the Isle of France and in South America.

SCIO. [Chios.]

SCIOPPIUS, CASPAR, was born on the 27th of May, 1576, at Neumark in the Palatinate (Pfalz) of a poor family. At the age of seventeen he published some Latin poems. After the completion of his studies he travelled into Italy, and in 1589 he was at Ferrara, where he wrote a panegyric on Pope Clement VIII. and the King of Spain. The Pope became his protector and patron, and Scioppius followed him to Rome, where he renounced the Protestant religion, and studied theology. He published several little works in support of the Pope against the Protestants. In 1605 he published an edition of Varro ' De Linguâ Latinâ.' He now commenced a controversy with Joseph Scaliger, in which he ridiculed his pretensions to noble birth with the bitterest satire. The book was also an attack on Protestants in general. Being in Venice, in 1609, he attempted to persuade Paolo Sarpi to join the Pope's party, for which the Venetians, who had at that time, a dispute with the Pope, put him in prison. After he was released he went to Vienna, where the Emperor made him a count palatine. In

1611 he published two works, 'Ecclesiasticus,' &c.; and 'Collyrium Regium,' &c., both of them mainly directed against James I. of England; the first also contained a renewal of the attack on Henry IV. of France, for giving civil liberty to the Protestants. The books were burnt in London and Paris by the common hangman, and Scioppius was hanged in effigy in London (1612). He afterwards returned to Italy, and then paid a visit to Madrid (1613), where he got a sound thrashing from the servants of the English ambassador. Upon this he fled from Spain to Ingolstadt, where he published his 'Legatus Latro' against the English ambassador, whom he supposed to have encouraged his servants to beat him at Madrid. The remainder of his life was very restless: he moved from place to place, continuing his violent attacks on the Protestants, and diversifying them with grammatical studies. He finally attacked the Jesuits, and to escape from their vengeance he retired to Padua, where he died in November, 1649, while engaged in a work on the Apocalypse.

Scioppius was a man of great learning, prodigious memory, and great acuteness. In his knowledge of Latin he had no equal. He was however quarrelsome and vindictive, a persecutor, and an unforgiving enemy. He is said to have written one hundred and four works; but many of them appeared under fictitious names. His controversial works may rest in the dust with the other useless lumber of that age; but his grammatical works are still useful. Among these numerous works are his 'De Arte Criticâ,' &c., Nürnberg, 1597, and Amsterdam, 1662, 8vo.; 'Grammatica Philosophica, sive Institutiones Grammaticæ Latinæ,' Milan, 1628, 8vo.: a new edition with additions appeared at Amsterdam, 1664, 8vo., and another at Franeker in 1704. He also wrote notes on the 'Minerva' of Sanctius (Sanchez), which appeared at Padua in 1663, and have been incorporated in the various subsequent editions of the 'Minerva.'

SCIPIO is the name of a family belonging to the patrician gens Cornelia. This illustrious family produced some of the greatest of the Romans. The first Scipio mentioned in Roman history is

1. *P. Cornelius Scipio,* whom, in 396 B.C., the Dictator Camillus appointed master of the horse. (Liv., v. 19.)

2. *P. Cornelius Scipio* is mentioned as one of the first curule ædiles, which office was instituted in B.C. 366.

3. *P. Cornelius Scipio Barbatus* was, according to the Fast. Cons., consul with C. Plautius in the year 328 B.C.; but Livy (viii. 22) calls the colleague of Plautius P. Cornelius Scapula. Scipio Barbatus was made dictator in 306 B.C., to hold the comitia for the election of the consuls. A year later he was pontifex maximus. (Liv., ix. 46.)

4. *L. Cornelius Scipio* was consul in 298 B.C., and gained a victory over the Etruscans in the neighbourhood of Fregellæ. (Liv., x. 12.)

5. *Cn. Cornelius Scipio Asina.* He is the first member of the family from whom we are able to trace the pedigree of the Scipios with certainty. He was consul at the time of the first Punic war (260 B.C.), together with C. Duilius, and obtained the command of the fleet; but in his attempt to take the island of Liparæ, he was blocked up by the Carthaginians in a port of the island. His soldiers escaped on land, but Scipio surrendered to the enemy. He was consul a second time in the year 254 B.C., with A. Atilius Calatinus. He and his colleague took Panormus, the largest town in the Carthaginian part of Sicily.

6. *P. Cornelius Scipio Asina,* son of No. 5, was consul in 221 B.C., with M. Minucius Rufus, and made a successful campaign against the Istri, who harassed the Romans by their piracy.

7. *L. Cornelius Scipio,* a brother of Cn. Cornelius Scipio Asina, was consul in 259 B.C., with C. Aquillius Florus. He put the fleet of the Carthaginians to flight, attacked them in Corsica and Sardinia, and destroyed the towns of Aleria and Olbia.

8. *P. Cornelius Scipio,* son of L. Cornelius Scipio, was consul in the first year of the second Punic war (218 B.C.). Scipio went to Spain, but hearing that Hannibal was preparing to cross the Rhódanus (Rhône), he returned by sea to Massilia. But Hannibal's movements anticipated the consul's plans, and the Carthaginian army crossed the Alps. Scipio embarked for Italy, and in the first engagement on the Ticínus, the Roman cavalry was defeated by the Carthaginians. Scipio now took up a position on the Trebia, and waited for the arrival of his colleague Sempronius from Sicily. On the arrival of Sempronius a battle was fought on the Trebia, in which the Romans were completely defeated.

In the summer of B.C. 217, Scipio was sent with a force into Spain, where his brother Cneius, who was his legatus, had carried on the war successfully against the Carthaginians. By defeating the enemy, and taking their general Hanno prisoner, Cneius became master of most of the country between the Ebro and the Pyrenees. In B.C. 216 the two brothers defeated the Carthaginian general Hasdrubal, who escaped with only a few men. In order to keep the goodwill of the Spaniards, who had been heavily taxed by the Carthaginians, the Scipios laid no heavy contributions on them. In the meantime, Mago arrived with a new army from Africa, but this fresh Carthaginian force was twice defeated by the Romans. The Scipios were successful in Spain until B.C. 212, when the Carthaginians mustered a large force in Spain, and took a large body of Celtibéri into their pay. P. Scipio fell in battle against Mago and Hasdrubal, the son of Gisco; and about a month after, Cneius and his forces were also cut to pieces by the Carthaginians. This calamity happened in the spring of B.C. 211.

9. *Cn. Cornelius Scipio Calvus,* the brother of P. Corn. Scipio (No. 8). His exploits in Spain have been briefly described. He was consul in 222 B.C., with M. Claudius Marcellus. At the beginning of the second Punic war he went to Spain as legate to his brother Publius.

10. *P. Cornelius Scipio Africanus Major,* the son of P. Cornelius Scipio (No. 8). If it be true that at the age of seventeen he fought in the battle of the Ticinus (218 B.C.), he must have been born in 235 B.C. He was in the battle of

Cannæ (216 B.C.) as a tribune, and was among those who escaped to Canusium. Here the chief command of the remaining troops was unanimously entrusted to him and Appius Claudius Pulcher. On this occasion it was owing to his presence of mind that the remnants of the Roman army did not in their despair quit Italy. In 212 B.C. Scipio was curule ædile, though he had not yet attained the legal age. In 211 B.C. his father and uncle fell in Spain, and Scipio was sent there in command with proconsular power, being then scarcely twenty-four years of age. This power was afterwards prolonged for several years (210-206 B.C.). About the middle of B.C. 210, he set out for Spain, and landed at the mouth of the Ibérus (Ebro). His first object was to gain possession of New Carthage. Lælius made the attack with the fleet from the sea-side, while Scipio conducted the operations on land. The town soon fell into the hands of the Romans, and the generosity with which Scipio treated the Spanish hostages gained over a great number of Spaniards. A battle was fought between Scipio and Hasdrubal Barcas (B.C. 209), in which the Roman general obtained a great victory. The Carthaginian general, who made his escape, began to raise a force with the intention of leading it into Italy to support his brother Hannibal. In B.C. 208 the propræ.or Silanus defeated Mago; and Hanno, who came with a force from Africa, was taken prisoner. In B.C. 207 Scipio gained a great victory at a place the name of which is variously stated by the authorities, and he was now nearly undisputed master of Spain. Soon afterwards he went over to Africa with his friend Lælius, to see Syphax, king of the Numidians, with whom Lælius had commenced negotiations. After returning to Spain, he subdued some of the refractory Spanish chiefs, and also quelled a mutiny among some of his own soldiers. Mago left Spain; and Gades, the last possession of the Carthaginians in the peninsula, was taken from them.

About the end of B.C. 206 Scipio gave up the command in Spain, and returned to Rome with an immense booty, which was paid into the aerarium, or public treasury. In B.C. 205 Scipio was elected consul. He obtained the command in Sicily with thirty ships, and permission to cross over to Africa, if he should think it advantageous for the state. It was the favourite scheme of Scipio to cross over into Africa, and thus to divert Hannibal from prosecuting the war in Italy. He raised volunteers among the Italian allies, and passed into Sicily, where he employed himself in training his forces, while he sent Lælius with part of the fleet into Africa, to maintain friendly relations with Syphax and Massinissa.

Massinissa was dissatisfied with the Carthaginians, but Syphax had again joined them. The conduct of Q. Flaminius, a legate of Scipio, led to an inquiry about Scipio himself, and commissioners were sent for that purpose from Rome to Sicily. But the result was favourable to Scipio, and he obtained permission to cross over into Africa. Scipio accordingly landed in Africa B.C. 204 with a large force, and defeated Hasdrubal. His object was to take Utica, but he could not effect this, and he was obliged to winter near it. Towards the close of the winter, the Carthaginians and Syphax, who were designing to attack Scipio, were themselves surprised by the Roman general. Syphax withdrew into his own territory, where he was taken prisoner by Massinissa and Lælius, with his wife Sophonisba, and one of his sons. Massinissa took Sophonisba to wife, but as she was a Carthaginian, Scipio fearing the influence that she might exercise over Massinissa, claimed her as a prisoner, and Massinissa gave her poison to save her from captivity. The Carthaginians now determined to recall Hannibal from Italy, and sued for terms of peace. Scipio was willing to grant it on terms favourable to the Romans; and a truce was made, and a Carthaginian embassy was sent to Rome. In the meantime the Carthaginian populace plundered some Roman ships which were wrecked on the coast, and the Roman envoys who were sent to demand reparation were insulted. Scipio did not resent this insult; and in the autumn of B.C. 203 Hannibal returned to Africa. In B.C. 202 the war was ended by Scipio defeating Hannibal near Zama. Peace was concluded on terms which destroyed the independence of Carthage.

On his return to Italy, Scipio entered Rome in triumph, and was henceforward distinguished by the name of Africanus. In 199 B.C. he was censor with P. Ælius Pætus, and in 194 B.C. he was made consul a second time with Tib. Sempronius Longus. In 193 B.C., during one of the disputes between the Carthaginians and Massinissa, Scipio was sent with two other commissioners to mediate between the parties; but nothing was settled. In 190 B.C. Africanus accompanied his brother Lucius, who was then consul, to carry on the war against King Antiochus. He acted as the legátus of Lucius in this campaign, which was terminated by the great battle near Sípylus, in which Antiochus was defeated. The consul granted the king reasonable terms of peace, but they were made much more severe when the treaty was ratified at Rome. When the two brothers returned to Rome, they were charged with having accepted bribes from Antiochus, and having retained part of the booty which should have been delivered up to the aerarium. Lucius was fined; and Africanus being summoned before the popular assembly, only saved himself by reminding the people of the battle of Zama. After these troubles, Scipio withdrew to his villa near Liternum, on the coast of Campania, where he spent the rest of his life in quiet retirement. The estates of his brother were seized to the public use (B.C. 187), but they did not produce the amount of the fine. His friends and clients would have made him even richer than before, but he refused everything beyond what was necessary for his support. (Liv., xxxviii. 60.) The year of the death of Africanus is not certain. Polybius places it in B.C. 183, the same year in which Hannibal and Philopœmen died; other accounts place it in B.C. 185. Scipio was a great commander, but we have

no evidence of his qualities as a statesman. By his wife, the daughter of Æmilius Paulus, he had two daughters, one of whom was Cornelia, the wife of Sempronius Gracchus, and the mother of the Gracchi.

11. *P. Cornelius Scipio*, son of the great Scipio Africanus (No. 10). He adopted a son of Q. Æmilius Paulus (No. 14).

12. *Lucius* or *Cneius Scipio*, the second son of Scipio Africanus Major (No. 10), was taken prisoner in the war with Antiochus. In 174 B.C. he was elected prætor urbanus.

13. *L. Cornelius Scipio Asiaticus, Asiágenes*, or *Asiágenus*, brother of Scipio Africanus (No. 10). He accompanied his brother Africanus in his campaigns in Spain. In 193 B.C. he was prætor in Sicily. In 190 B.C. he was made consul with Lælius, and obtained Greece as his province, with the command in the war against Antiochus. After the conclusion of the war with Antiochus, he assumed the name of Asiaticus, and entered Rome in triumph. (See No. 10.)

14. *P. Cornelius Scipio Æmilianus Africanus Minor*, son of L. Æmilius Paulus, and the adopted son of P. Cornelius Scipio (No. 11), was born about 185 B.C. From his youth he cultivated the friendship of Polybius, Panætius, Lælius, and others. But with his partiality for science and Greek refinement and art, he esteemed no less the stern virtues of the old Romans. Cato the Censor was in this respect his model. At the beginning of the third Punic war, 151 B.C., he was a military tribune in Spain, under L. Lucullus. In this campaign he killed a Spanish chief in single combat, and was the first to scale the walls of Intercatia, which the Romans were beseiging. In B.C. 150 he was sent to Massinissa in Africa to procure elephants, to take over into Spain. When the war again broke out between Rome and Carthage, Scipio again served in Africa as military tribune, where he gained a great reputation. In 148 B.C., the consul Calpurnius Piso had the command in Africa, and Scipio returned to Rome. Piso made little progress in Africa, and Scipio was elected consul for B.C. 147, though he had not attained the legal age, and he had Africa for his province. He was accompanied to Africa by the Greek historian Polybius, and his friend Lælius. He restored confidence and discipline in the Roman army, and he cut off the supplies of the Carthaginians. His command being prolonged to 146 B.C., he made his assault on the city of Carthage, which he took after a desperate resistance. By a decree of the Romans, Carthage was razed to the ground. On his return to Rome, he entered the city in triumph. In 142 B.C. Scipio was censor with L. Mummius, and in the midst of an age of universal luxury he exercised the office with impartial severity. The war against Numantia in Spain having long been unsuccessfully carried on, Scipio was elected consul for B.C. 134, during his absence from Rome. On arriving in Spain, he found the Roman army in a bad state of discipline, but he soon restored order, and continued the seige of Numantia, till the inhabitants were compelled by famine to yield. Most of the citizens put an end to their lives, and the place was razed to the ground. It was during the seige of Numantia that the disturbances commenced at Rome, owing to the agitation of Tib. Gracchus. Scipio, though the husband of Sempronia, the sister of the Gracchi, approved of the violent measures of the senate against his brother-in-law, who lost his life B.C. 133. That his popularity had now declined appears from the fact that in B.C. 131, when he was inclined to undertake the command in the war against Aristonícus, he only obtained the votes of two tribes. Soon after this, Scipio made a proposal in favour of the old Italian veterans, which had been approved by the senate, with respect to the distribution of the public land. This measure produced a delay in the distribution itself, and the popular leaders, F. Flaccus, C. Gracchus, and Papirius Carbo, made the bitterest invectives against Scipio in the assembly, and called him the enemy of the people.

After these fierce debates Scipio went quietly home accompanied by the senate, the Roman people, and a great number of Latins and Roman allies. In the evening he went into his bedroom with the intention of writing a speech to be delivered the following morning. But in the morning Scipio was found dead in his bed (129 B.C.). There was no inquiry into the cause of his death, but public opinion pointed out many who were suspected of having murdered him, and the heaviest suspicion fell upon Carbo.

15. *L. Cornelius Scipio*, son of L. Cornelius Scipio Asiaticus, was quæstor in 167 B.C.

16. *L. Cornelius Scipio*, son of L. Cornelius Scipio (No. 15), was consul with C. Junius Norbanus, B.C. 83, and marched against Sulla, but he was abandoned by his army, and taken prisoner. In 82 B.C. he was sent into exile, and spent the remainder of his life at Massilia.

17. *P. Cornelius Scipio Nasica*, son of Cn. Cornelius Scipio Calvus (No. 9). In the year 203 B.C. he was declared by the senate to be the best of all good citizens, and commissioned to go with the Roman matrons to Ostia to receive the Idæan Mother, who had been brought from Pessinus. In 200 B.C. he was one of the triumvirs to complete the number of colonists in Venusia. In 196 B.C. he was curule ædile; in 194 B.C. he was prætor, and the year following proprætor in Spain, where he fought several successful battles to the west of the Ibérus. In B.C. 191 he was consul with M'. Acilius Glabrio (Liv., xxxv. 24), and gained a signal victory and a triumph over the Boii.

18. *P. Cornelius Scipio Nasica Corculum*, son of P. Cornelius Scipio Nasica (No. 17), married a daughter of Scipio Africanus Major, and distinguished himself in the campaign of Æmilius Paullus in Macedonia. In 162 B.C. he was consul; and in 159 B.C. was censor with C. Popillius Lænas. Scipio in his censorship introduced at Rome the use of a public clepsydra, and built a portico to the Capitol. In his second consulship, 155 B.C., he gained a victory over the Dalmatians. During this year, on his proposal, the senate ordered a theatre to be pulled down, the erection of which had been approved by the censors. Scipio thought a theatre injurious

to the morals of the Romans. When Cato insisted upon the destruction of Carthage, Scipio Corculum opposed him on the ground that the existence of such a rival as Carthage was most wholesome to Rome, as a check against corruption. In 150 B.C. he became pontifex maximus.

19. *P. Cornelius Scipio Nasica Serapio,* son of P. Cornelius Scipio Nasica Corculum (No. 18). Before the outbreak of the third Punic war he was quæstor, and commissioned, with the consuls Censorinus and Manilius (149 B.C.), to demand from the Carthaginians the delivery of their arms to the Romans. In 138 B.C. he was consul with D. Junius Brutus Gallaicus. Scipio was a man of vehement temper, and of inflexible aristocratic principles. His hatred of the measures of Tib. Gracchus was so great, that during the election of the tribunes he placed himself at the head of his party in their attack upon Gracchus in the Capitol, B.C. 133. This enraged the people so much that the senate thought it advisable to send him on an embassy to Asia, although as pontifex maximus he was not allowed to quit Italy. He died at Pergamus soon after his arrival in Asia.

20. *P. Cornelius Scipio Nasica,* son of P. Cornelius Scipio Nasica Serapio, was consul in 111 B.C. with L. Calpurnius Piso Bestia, who went out against Jugurtha, while Scipio remained in Italy. He was inaccessible to bribes, and throughout his life behaved in the most exemplary manner. He died during his consulship. Cicero says that in wit and humour he excelled everybody.

21. *P. Cornelius Scipio Nasica,* son of P. Cornelius Scipio Nasica (No. 20). He was prætor in 94 B.C. His wife was Licinia, the daughter of the orator L. Crassus. He was the father of L. Licinius Crassus Scipio, whom Crassus the orator adopted, and of Q. Metellus Pius Scipio, who was adopted by Q. Metellus Pius, and was father-in-law of Pompeius. Metellus Scipio was defeated by Cæsar, and fell in Africa.

There were also four Scipiones named Hispallus, but they require no particular notice here.

The family tomb of the Scipios was first discovered in 1616, but it was soon forgotten. In 1780 the tomb was again discovered close by the modern gate of San Sebastian. In the course of a year the whole catacomb, though in a dilapidated state, was cleared and laid open. The inscriptions and other curiosities, among which was the beautiful sarcóphagus of Scipio Barbatus, were transferred to the Museum Pio-Clementinum at Rome. The monuments with their inscriptions are described in 'Monumenti degli Scipioni, publicati dal Cavaliere Francesco Piranesi,' Roma, 1785, fol.; and in Lanzi, 'Saggio,' vol. i., p. 150, &c. For the inscriptions see Orelli, 'Inscript. Lat.,' n. 550–559.

SCIRE FACIAS, a writ sued out for the purpose either of enforcing the execution of, or of vacating, some already existing record. It directs the sheriff to give notice ('Scire facias,' whence the name) to the party against whom it is obtained to appear and show cause why the purpose of it shall not be effected. A summons to this effect must be served on the party, who must enter an appearance, after which a declaration is delivered to him, reciting the writ of scire facias. To this he may plead or demur, and the subsequent proceedings are in the nature of an action. If the party cannot be summoned, or fail to appear, judgment may be signed against him. The proceedings under a scire facias may be divided into—

1. Those where, the parties remaining the same, a scire facias is necessary to revive or set in operation the record.

2. Those where another party seeks to take the benefit of it, or becomes chargeable, or is injured, by it.

If a year and a day have elapsed since judgment has been signed, and nothing (such as a writ of error, an injunction, &c.) has existed to stay further proceedings, it is a legal presumption that the judgment has either been executed, or that the plaintiff has released the execution. In such case execution cannot issue against the defendant until he has had an opportunity, by means of the notice given him under a scire facias, of showing any cause existing why execution should not issue against him. If the judgment has been signed more than ten years, a scire facias cannot issue unless with the permission of the court or a judge; and by the statute 3 & 4 Wm. IV. c. 27, s. 40, proceedings appear to be limited to a period of twenty years.

3. The cases of more ordinary occurrence under the second head are those where one of the parties to an action becomes bankrupt, or insolvent, or dies, or, being a female, marries, or where it is sought to enforce the rights of a plaintiff against the bail to an action, or to set aside letters patent. If a woman obtain a judgment and marry before execution, the husband and wife must sue out a scire facias to have execution. And if judgment is obtained against a woman, and she marries before execution, a scire facias must be brought against her and her husband before execution can be obtained. A scire facias is the only proceeding for the purpose of repealing letters patent by which the king has made a grant injurious to some party. The king may have a scire facias to repeal his own grant, and any subject who is injured by it may petition the king to use his name for its repeal.

SCIRPUS, a genus of plants belonging to the natural order *Cyperaceæ* and the tribe *Scirpeæ*. *S. maritimus* is found in salt marshes in Great Britain, and is much relished by cattle. *S. lucustris,* Bullrush, is found in rivers and ponds in England. The root is astringent and diuretic, and was once used in medicine. The leaves are employed for making matting, chair bottoms, and many other domestic purposes. *S. triqueter* is found on the muddy banks of the Thames, near London, and in the Arun, near Amberley, Sussex. *S. tuberosus* is the Pi-tsi, or Water-Chestnut, of the Chinese, and is cultivated by them for food in large tanks, which are regularly manured and the water at intervals drawn off. The tubers are eaten both raw and cooked. There are 14 British species of *Scirpus.*

SCIRRHUS. [CANCER.]

SCIURIDÆ. [Squirrels.]

SCLAVONIA, SCLAVONIANS. [Slavonia, &c.]

SCLERANTHA'CEÆ, a small natural order of plants placed by Lindley in the curvembryose group of Incomplete Exogens. They are mostly natives of barren fields in Europe, Asia, and North America. The Polish or German Cochineal is obtained from the roots of this plant.

SCLERANTHUS, a genus of plants belonging to the natural order *Paronychieæ*. *S. annuus*, Annual Knawel, is found in sandy fields in Great Britain. *S. perennis* is found in sandy places in Europe, the Levant, and in England. The Polish Cochineal (*Coccus Polonicus*) is frequently found on the roots and leaves of this plant in the summer months.

SCLERO'CHLOA, a genus of grasses belonging to the tribe *Festucineæ*. *S. maritima* is found on sea-coasts and damp places in Great Britain. *S. distans* is the *Glyceria* of Smith. It is found on sandy sea-shores in England.

SCLERODERMI, the second family of Plectognathous fishes (such as have incomplete and soldered jaws). The *Sclerodermi* are distinguished by their conical or pyramidical snouts, ending in a small mouth, with distinct teeth in each jaw. The skin is rough, or covered with large hard scales.

The first division of *Plectognathi* is named *Gymnodontes*. The fishes included in it have no true teeth, but a substitute in a lamellated substance, resembling ivory, which covers the jaws. It includes the *Tetrodon*, the *Diodon*, the *Osthagoriscus*, or Sun-Fish, and other genera.

The *Sclerodermi* are mostly tropical fishes, and are remarkable for their brilliant colours. One genus only occurs in the British seas, and that but very rarely; the *Balistes*, or File-Fish, is the one alluded to. The *Ostracion* is remarkable for having its body clothed in an inflexible armour of hard plates, the tail-fins, mouth, and gill-openings passing through holes in its coat of mail.

SCO'LIA were short drinking-songs, invented and used by the ancient Greeks. These songs were generally accompanied by the lyre. The extant specimens of them seldom exceed four lines. Terpander is said to have been the first who wrote scolia, and he was followed by Alcaeus, Sappho, Anacreon, Simonides, Pindar, and others. A collection of extant scolia was made by C. D. Ilgen, Jena, 1798.

SCO'LIADÆ, a family of Fossorial Hymenopterous Insects, distinguished by the following characters combined: antennæ thick in the females, shorter than the head and thorax; femora bent near the apex, and compressed; legs short and stout, and densely clothed with spiny hairs. The thorax is often short, and produced on each side.

M. Latreille divides this family into the genera *Scolia*, *Tiphia*, *Meria*, *Tengyra*, and *Myzine*.

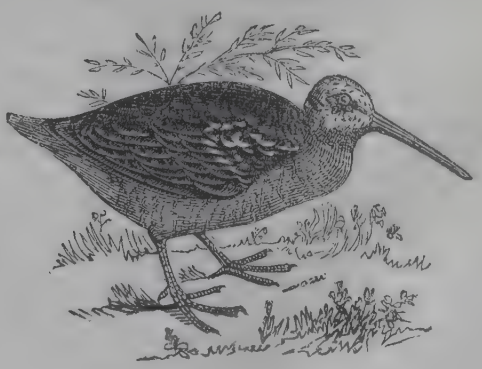
SCOLOPA'CIDÆ, an important family of birds of the grallatorial order. [Grallatores.]

It is impossible here to follow out the views of ornithologists relative to the present family, which, leaving out the genus *Ibis*, is equivalent to the *Longirostres* of Cuvier. Some admirable observations on the affinities of the genera included under the Scolopacidæ by Mr. Vigors, will be found in his paper 'On the Natural Affinities, &c., of Birds,' in the 'Linn. Trans.,' vol. xiv. Mr. Swainson, in the 'Classification of Birds,' vol. ii., may also be consulted; nor should the student omit reference to the Prince of Canino's 'Birds of Europe and North America;' to Mr. G. R. Gray's arrangement; and to Yarrell's 'British Birds.'

'The Scolopacidæ,' says Mr. Selby, 'are inhabitants of the marshes, and the shores of lakes, rivers, and the sea. They live entirely on animal matter, such as worms, insects, mollusca, the roe and small fry of fishes. Most of the genera procure food by thrusting the bill into the soft earth, or the mud of shores, and thence extract their prey. To facilitate this, an extraordinary development of the nerve is distributed over and to the extreme point of the bill, thus endowing them with an exquisite sense of feeling; and in many species this member is further provided with a peculiar muscle, which, by the closing or contracting of the upper part of the mandibles, operates so as to expand them at the point, and enables the bird, with the bill still buried in the ground, to seize its prey the moment it is aware of being in contact with it. From this peculiar mode of searching for their prey, these are frequently styled *birds of suction*. They all possess great power of flight, having an ample development of wing, and are generally subject to the laws of migration. Species of this family are found in all parts of the world, and many of the genera have a very wide geographical distribution. Their nidification is on the ground, and they lay four eggs of a peculiar form, one end being large and rounded, the other decreasing to a point. The position of these in the nest is with the rounded end outwards, the smaller inwards, and meeting together in the centre of the nest. Thus placed they occupy a small space, and are more easily covered in incubation than they would be if disposed in any other. The flesh of these birds is in general succulent and well flavoured.'

Genus *Scolopax*.

Scolopax rusticola, the Woodcock. This bird is too well known, and has been too often described



Woodcock (*Scolopax rusticola*).

in the pages of the naturalist and the sportsman to need much comment.

It is the *Bécasse* of the French; *Beccaccia* of the Italians: *Waldschnepfe* of the Germans; and *Woodcock* of the British. It is most probably the Σκολόπαξ (*Scolopax*) of Aristotle.

The species is found in Western Lapland beyond the Arctic Circle, in Finland, Russia, Siberia, rarely in Germany, and more rarely in France. A few have been known to breed in Switzerland. It is noted by the Prince of Canino as very common in Italy, and has been found all the year through at Madeira. Barbary possesses it, and at Athens it is by no means uncommon. They have been seen abundantly in Smyrna, and have been found in Aleppo and Egypt. It has been noticed in Cashmere and in Japan, in which last locality it is subject to the same varieties as with us.

The Woodcock breeds occasionally, not to say frequently, in this country, in Scotland especially. The nest is placed on the ground in a dry warm spot among herbage, and is loosely fabricated of dead leaves, of the common fern principally, and unlined. The eggs, three or four in number, are pale yellowish white, blotched, and spotted at the larger end with ash-gray, and two shades of reddish-yellow brown. When surprised, the old birds have been known to carry off their young in their bills and claws.

Scolopax major, the Great or Solitary Snipe, *Grande* or *Double Bécassine* of the French, is an occasional visitant to the British Islands.

Scolopax Sabini, Vigors, Sabine's Snipe, is a rare visitant to our island.

Scolopax Gallenago, the Common Snipe, *Bécassine* of the French, is a well known autumnal visitant to our marshes; but considerable numbers remain with us, retiring to the moors of the northern parts of England, and to the Highlands of Scotland, as spring advances, in order to breed. Some few breed in the fenny lands of the midland and more southern counties.

Scolopax Gallinula, the Jack Snipe, the smallest of the British snipes.

Genus *Strepsilas*.

Strepsilas collaris, the Turnstone, or Sea Dottrel. This is the *Steinwälzer* of Brehm.

Geographical Distribution.—Very wide. Nova Zembla, Greenland, Winter Island, Felix Harbour, the coast between Victoria Harbour and Fury Point — about the middle and end of June. Shores of Hudson's Bay and of the Arctic Sea up to the seventy-fifth parallel, where it breeds in June, quitting in September, halting in October on the shores of the Delaware, and proceeding farther south on the setting in of cold weather. The United States, the Straits of Magalhaens, Cape of Good Hope, Japan, Sunda, the Molucca Islands, and New Guinea. In Europe, from Russia southward to Italy, Norway, Madeira. In this country it is found on the coasts from August to May, when it returns northward to breed. Stationary in Zetland, according to Dr. Fleming, who concludes that it breeds there.

Food, Habits, &c.—The Turnstone, as its name implies, procures its food—small crustaceans, molluscuous animals, &c.,—by turning over with its strong bill the stones which shelter its prey on the shore. Mr. Hewitson found its nest on the coast of Norway placed against a ledge of rock, and consisting of nothing more than the dropping leaves of the juniper bush, under a creeping branch of which the eggs, four in number, of an olive-green colour, spotted, and streaked with ash-blue and two shades of reddish-brown, were concealed and sheltered.

The Turnstone, from its early age to an advanced period of life, is subject to many marked varieties of plumage, which led the elder naturalists into some errors, which have since been rectified.

Genus *Totanus*.

Totanus Calidris, the Redshank, or Sandpiper, a well-known bird, and permanent resident in our country, inhabiting the marshes in summer, the sea-coasts in winter.

Totanus Glottis, the Greenshank Sandpiper, a scarce autumnal visitant, though it appears that some few breed upon the edges of the Scottish lakes.

Totanus hypoleucus, the Common Sandpiper, a beautiful little bird which periodically visits our island to breed, appearing in April, and resorting to the margins of lakes, rivers, morasses, &c. In the autumn the sandpiper migrates southward, wintering in Southern Europe, Asia, and Africa.

Totanus stagnatilis, Le Chevalier à Longs Pieds of Borelli. The young and the adults differ much in plumage from each other; and the adult plumage of summer is very distinct from that of winter. This species is not a British bird. It inhabits north-eastern Europe, migrating to the Mediterranean, but never along the maritime coasts.

The winter plumage of the individuals of the isles of Sunda, Timor, and New Guinea is rather paler than in those killed in Europe. In the young there is no difference. In their nuptial plumage they are never received from those islands. The species also inhabits the eastern parts of Europe.

Genus *Machetes*.

Machetes pugnax, the Ruff (male), and the Reeve (female). This elegant species is a summer visitant to the extensive marshes of our island, retiring southwards in autumn. The summer or nuptial plumage of the male is distinguished by a ruff of long feathers covering the neck, and two thick tufts of feathers springing from the sides of the head. The face is covered with small fleshy excrescences. The ruff and ear-tufts disappear in winter, as do also the excrescences. It is a very remarkable circumstance, that in no two individuals is the colour of the ruff and indeed of the general nuptial plumage of the male alike, nor in the same bird for two successive years. The ruff may be seen jet black, rufous brown, yellow barred with black; white barred with black, mingled white black and brown, &c.

The female is plain in her attire, and a third less in size than the male.

Ruff (*Machetes pugnax*). Male. In Summer Plumage.

In habits the Ruff (male) is polygamous, and highly combative. Shortly after the arrival of the flocks at the marshes, each male arrogates to himself a territory, called his *hill*, round which he moves, awaiting the approach of any of the other sex, whose appearance acts as the signal for a general fight, for bold intruders now rush forward from adjacent spots and invade his territory, and the battle rages until the lord of the hill drives back his invaders, or is put to flight, the favours of the female being granted to the ultimate victor. This scene continues day after day during the month of May and the early part of June. Every night the males disperse among the marshes to feed, returning each to his petty territory in the morning, prepared to maintain their respective rights. With the cessation of the combative ardour, which occurs when the females commence the task of incubation, the males lose their martial plumes, and the facial tubercles gradually fade away and give place to small feathers.

The delicacy of the flesh of this bird for the table is well known; and in former times, before our fens were drained, vast numbers were caught and put up to fatten. Montague, in his 'Ornithological Dictionary' (Supplement), enters into a long account of the modes pursued, both by the fowlers and by those who engaged in the business of bringing the birds into condition, the two departments of capturing and fattening being divided by two different classes of persons. In Montague's time fatted ruffs sold for two guineas the dozen.

The geographical distribution of this species is confined to the old continent. It visits Iceland and the northern parts of Russia, but the limits of its equatorial movements have not been well ascertained.

Genus *Phalaropus.*

Phalaropus lobatus, the Gray Phalarope. *Ph. platyrhynchus*, Temm. The differences of plumage in this species, according to the season of the year and to age, have led to much confusion, and the establishment of several fictitious species, which are now reduced to their proper bounds. Bill slender, toes festooned with lobated membranes dentilated at their edges.

Geographical Distribution.—Within the Arctic circle; the eastern parts of the north of Europe; abundant in Siberia, on the shores of great lakes and rivers; migratory on the great lakes of Asia and on the Caspian Sea; numerous in America; migratory, but at uncertain intervals, throughout most of the countries of Europe; rare in Switzerland, on the lake of Geneva; with us it is a winter visitor. It appears to be spread generally from the northern towards the intertropical regions.

Food, Habits, &c.—The food of the Gray Phalarope consists for the most part of insects or crustaceans which live on the surface of the water, and it very rarely seeks for its nourishment on the banks or on land. M. Temminck refers to Major Sabine's memoir 'On the Birds of Greenland,' where that acute observer relates that on the 10th of June, and at the 68th degree of latitude (where the species breeds), a number of these birds were seen swimming at sea in the middle of icebergs, and at a distance of four thousand miles from land; and M. Temminck observes that he cannot see why this bird, with such habits and such a form as it has, should be associated with the Snipes and Chevaliers.

Mr. Gould ('Birds of Europe') remarks that 'the places which it not uncommonly chooses for its residence during its sojourn with us are such as would possess for it, according to our ideas, but little attraction; thus, for instance, it will often continue for weeks together, if unmolested, about a farm-yard pond or mere puddle, manifesting a familiar and unsuspecting disposition, and allowing itself to be approached with freedom; it does not however appear to confine itself much longer to one spot, but after remaining at a certain place from one to three or four weeks, suddenly departs, if on the approach of spring towards the north, and in autumn towards the south; every European country, in fact, appears to be equally visited, although at uncertain and often long intervals. Like the other species, it is an admirable swimmer, taking its food on the surface of the water with the utmost agility and address; indeed it appears to seek its nourishment there alone, and may be watched while assiduously engaged in this occupation, displaying a thousand graceful attitudes and manœuvres.'

The eggs are greenish-ash, spotted with black.

Genus *Numenius.*

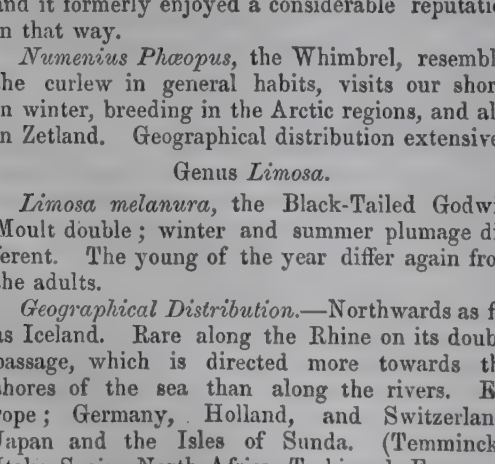
Numenius arquatus, the Common Curlew; *Courlis* of the French; *Ciarlotto* and *Chiurle Maggiore* of the Italians; *Der Grosse Krumschnäblichte Schnepfe* and *Keilhacke* of the Germans.

Geographical Distribution.—Very wide in the Old World (the American species is different). Equally diffused from the sultry portion of the torrid zone to the frozen countries of the north: the islands of the Pacific Ocean, particularly Australia, are not devoid of its presence, and we also possess examples from China, Nepaul, &c.

Very common in Asia. Extends to Japan. Dr. Andrew Smith brought individuals from South Africa.

Food, Habits, &c.—The food of this well known and wary bird, which in Scotland is called the Whaup, consists of earth-worms, slugs, small testaceans, and insects.

The nest, which consists of a few dry leaves, &c., carelessly put together, is placed among rushes or long grass and heath; Temminck says, often in the downs which border the sea. The egg, which is large (2 inches 7 lines long, 1 inch 11 lines broad), is olive-green, blotched, and spotted with darker green and deep brown. It breeds in these islands. The young run almost as soon as they are out of the shell, but do not fly for a long time. The clear whistle of the bird is usually uttered on the wing, but Mr. Hewitson saw a curlew perch on the top of a pine in Norway, during summer, and in that situation it uttered its cry.



Curlew (*Numenius arquatus*).

The bird, at certain seasons, is not bad eating, and it formerly enjoyed a considerable reputation in that way.

Numenius Phæopus, the Whimbrel, resembles the curlew in general habits, visits our shores in winter, breeding in the Arctic regions, and also in Zetland. Geographical distribution extensive.

Genus *Limosa*.

Limosa melanura, the Black-Tailed Godwit. Moult double; winter and summer plumage different. The young of the year differ again from the adults.

Geographical Distribution.—Northwards as far as Iceland. Rare along the Rhine on its double passage, which is directed more towards the shores of the sea than along the rivers. Europe; Germany, Holland, and Switzerland. Japan and the Isles of Sunda. (Temminck.) Italy, Spain, North Africa, Trebizond, Erzeroom, and the neighbourhood of the Caucasus. Mr. Gould states that it inhabits the whole of the European continent, and that examples are found in most collections from Africa and India. With us they are most frequently seen in spring and autumn. They breed mostly in high northern latitudes, but occasionally in England. In Ireland the species is but seldom seen.

Food, Habits, &c.—The food consists of insects and their larvæ, worms, &c. The nest is formed of dry grass and herbage, and the four eggs are light olive brown, blotched and spotted with darker brown.

Godwits were formerly considered most delicious eating.

Limosa rufa, the Red Godwit. Distribution, Europe generally. Habits as in the preceding.

Genus *Cladorhynchus*, G. R. Gray.

Cladorhynchus pectoralis.—This genus very closely approximates to the Stilt Plovers (Himantopus). The present species is a native of southern and western Australia.

SCOLOPENDRA, according to Latreille, a genus of the order *Myriapoda*, and belonging to a section of that order termed *Chilopoda*. In the classification of Dr. Leach the *Myriapoda* are raised to the rank of a class; and Latreille's section *Chilopoda* is regarded as an order, to which the name *Syngnatha* is applied. The species of the genus *Scolopendra*, as now restricted, are distinguished from others of the section of which they form a part, by their possessing at least twenty-one pairs of legs, and there are more segments apparent on the upper surface of the body than on the under; the antennæ are composed of seventeen joints; the eyes are distinct, and are four in number on each side. These insects inhabit the southern parts of Europe, and all the tropical portions of the globe; their mandibles (which, strictly speaking, it would appear are formed by the second pair of legs) are terminated by a sharp hook, which is pierced for the transmission of a venomous fluid. The *Scolopendræ* have the body long, slender, and depressed, and protected by coriaceous plates: they run very fast, and shun the light, living for the most part under logs of wood and the loose bark of decayed trees. Their venomous properties cause them to be much dreaded in the hot climates which they inhabit.

SCOLOPE'NDRUM, a genus of ferns belonging to the tribe *Aspleneæ*. *S. vulgare*, Hart's Tongue, is a particularly handsome and ornamental fern, and very different from every other British species. It is universally and abundantly distributed throughout the British Isles. It is very commonly found on old walls and ruins. It is also found in Europe, sparingly towards the North, and in the United States. It is not however described as growing in Africa, Asia, or South America. This fern is the *Phyllitis* of Ray and all older botanists. It was once much used as a medicine. Ray mentions it as an astringent, and speaks of its healing powers, applied as an ointment to wounds and ulcers.

SCO'MBRIDÆ, a family of fishes of the section *Acanthopterygii*, of which the common Mackerel may be regarded as a type: the Tunny, Sword-Fish, Dory, and Boar-Fish also belong to this group, which contains a multitude of species and many genera.

In the genus *Scomber*, as now restricted, the body is covered with small smooth scales; the dorsal fins are widely separated; the hinder part of the second dorsal, as well as of the anal fin, is divided into numerous small spurious fins or finlets, which extend along the hinder part of the

body, above and beneath, almost to the tail; the sides of the tail are carinated, and the body is elongated and tapering at both extremities. To this genus belongs the common Mackerel (*Scomber Scomber* of Linnæus, or *Scomber vulgaris* according to some authors), a fish too well known to require to be described here. 'This fish,' Mr. Yarrell observes, 'it is probable inhabits almost the whole of the European seas; and the law of nature which obliges it and many others to visit the shallower waters of the shores at a particular season, appears to be one of those wise and bountiful provisions of the Creator by which not only is the species perpetuated with the greatest certainty, but a large portion of the parent animals are thus brought within the reach of man, who, but for the action of this law, would be deprived of many of those species most valuable to him as food.'

'The most common way of fishing for mackerel, and the way in which the greatest numbers are taken, is by drift-nets. The drift-net is 20 feet deep, by 120 feet long; well corked at the top, but without lead at the bottom. They are made of small fine twine, which is tanned of a reddish-brown colour, to preserve it from the action of the sea-water; and it is thereby rendered much more durable.'

SCONE. [PERTHSHIRE.]

SCOPAS, a sculptor, born in the island of Paros. Pliny ('Hist. Nat.,' xxxiv. 8) makes Scopas contemporary with Agéladas, Polyclétus, Myron, and other distinguished artists who were living in the eighty-seventh Olympiad; but it seems probable that he did not flourish till between 400 and 300 years B.C. Like many artists of antiquity, he united the two professions of sculpture and architecture; and the temple of Minerva Alea, at Tegea in Arcadia, was constructed under his direction. (Pausanias, viii. 45.)

Pliny furnishes a list of works by this artist. Among those which he says were particularly worthy of admiration was a series of figures representing Neptune, Thetis, Achilles, Nereids mounted on dolphins, and attended by Tritons and other marine monsters. He tells us there was a doubt in his time whether some statues representing the dying children of Niobe in the temple of Apollo Sosianus at Rome, were by Scopas or Praxiteles. The well-known group of figures representing this subject, now preserved in the gallery of the grand-duke of Tuscany at Florence, is generally believed to be the work alluded to by Pliny.

Scopas was employed upon the tomb of Mausólus, which was considered by the ancients one of the seven wonders of the world. It was of a square form, having four faces. The eastern façade was decorated by Scopas; the northern by Bryaxis; the southern by Timótheus; and the western by Leóchares.

SCO'POLI, GIOVANNI ANTONIO, was born at Cavalese in the Tyrol, June 13, 1723. After pursuing his preliminary studies at Trient, he went to Innspruck, and took the degree of M.D. at that university in 1743. He early displayed a great fondness for natural history, and was in a great measure self-taught. Botany especially attracted his attention. A journey which he made to Vienna led to his obtaining an appointment as a physician at Idria. Here he published a Flora of Carniola, and his proximity to the quicksilver mines gave him many opportunities for cultivating mineralogy. The result of these studies appeared in various memoirs, among which was a valuable essay on the diseases to which the miners are liable. He was appointed professor of mineralogy at Idria, and on the removal of Jacquin to Vienna, Scopoli succeeded to the chair of mineralogy at Schemnitz. In 1777 he was appointed professor of natural history at Pavia, where he died, May 8, 1788.

SCORE, in Music, is a collection of all the vocal and instrumental parts of a composition, arranged on staves, one above the other, and bar for bar, presenting at once, to the eye of a skilful musician, the effect of the whole band as the composition proceeds.

SCORPÆNA, a genus of *Acanthopterygious* osseous fishes of the family *Loricati*. Their heads are large, compressed, and more or less armed with spines or tubercles; the body is oblong and scaly. On the back is a single dorsal fin; the branchiostegous membrane has seven rays; and the jaws and palatines are armed with velvety teeth. They reside mostly on rocky grounds, feeding on crustacea and small fish. One only inhabits our seas, and is very rare, the Bergylt, or Norway Haddock, a fish resembling the perch, and attaining a length of two feet and more. In the Mediterranean are some beautifully-coloured species of this genus.

SCORPIO, a genus of the class *Arachnida*, order *Pulmonaria*, and section *Pedipalpi*. The animals of this genus (commonly called Scorpions), are distinguished from other groups of spiders by their having the abdomen articulated and terminated by a curved spur at the extremity; the palpi are very large, and the terminal segment assumes the form of the lobster's claw, being in like manner provided with pincers; the stigmata are eight in number, and situated along the inferior and lateral part of the abdomen; on the under side of the thorax are two comb-like appendages; the number of the eyes varies from eight to twelve in different species, and some subgenera have been established upon this character. Those to which the term *Scorpio* is used in its most restricted sense have only six eyes; those Scorpions which have eight eyes constitute the subgenus *Bathus;* and those which have twelve eyes, *Androctonus.*

'These Arachnides,' says Latreille, 'inhabit the hot countries of both hemispheres, live on the ground, conceal themselves under stones and other bodies, most commonly in ruins, dark and cool places, and even in houses. They run with considerable swiftness, curving the tail over the back; this they can turn in every direction, and use for the purposes of attack and defence. With their forceps they seize various insects, on which they feed after having pierced them with their sting. They are particularly fond of the eggs of spiders and insects.

The wound occasioned by the species found in the southern parts of Europe (*Scorpio Europæus*), is not usually dangerous; but according to the experiments of Dr. Maccary, made upon himself, the sting of some other and larger species produces serious and alarming symptoms, and the older the animal the more active seems to be the poison. The remedy employed is the volatile alkali, used externally and internally.

The young scorpions are produced at various intervals, and are carried by the parent for several days upon her back, during which time she never leaves her retreat.

SCO'RPIUS, or SCORPIO (the Scorpion), a constellation of the zodiac, lying between Libra and Sagittarius, and bounded north and south by Ophiuchus and Lupus. It contains one star of the first magnitude, which, with Spica Virginis, and Arcturus, forms a conspicuous triangle. This constellation was formerly two signs of the Greek zodiac, the claws occupying the place of Libra. The story is that the chelæ or claws of the Scorpion were drawn back by Roman astronomers, and the constellation Libra added in honour of Julius Cæsar, at whose death a new star was said to have appeared in that part of the heavens. This story is alluded to, not very distinctly, by Virgil; Hygínus is totally silent about it, merely saying that his countrymen call one part of this constellation Libra; Manilius uses both Libra and Chelæ. Ptolemæus does not mention Libra in his catalogue, though he does elsewhere. Dupuis contends, from its presence in the most ancient Indian and Persian zodiacs, that it is in reality as ancient as the rest: and indeed it is not unlikely that the Greeks may have derived their zodiac from some nation in which the term for scales was confounded with that for claws, either by a synonyme in the language itself, or by mistranslation on their part.

SCOT, from *sceat*, an Anglo-Saxon word originally signifying 'a part' or 'portion.' Previous to the Reform Act, 2 W. IV., c. 45, in many boroughs the payment of scot and lot constituted a qualification as a voter for a member of parliament. Those who possessed such qualification at the time of passing the Act have, under certain conditions, their rights reserved. The qualification consists in the payment of the rates which are allotted to each person as the proportion to be contributed by him. The criterion adopted for the purpose of ascertaining the scot and lot voters of a borough, is the poor-rate of the respective parishes comprised in it.

SCOT, REGINALD, was born early in the 16th century, in which he was the most distinguished opposer of the then almost universal belief—witchcraft. He was the son of an English gentleman of family, and educated at Oxford. He took no degree there; but devoted himself to study, and occupied his hours of relaxation in gardening. The fruits of this learned leisure were, 'A perfect Platform of a Hop-Garden,' and 'The Discoverie of Witchcraft,' 1584. This last book was burnt by the common hangman, and 'refuters' appeared on all sides. It was abused by Meric Casaubon, Glanvil (author of the 'Scepsis Scientifica'), and finally, by King James himself, who wrote his 'Demonologie,' as he informs us, 'chiefly against the damnable opinions of Wierus and Scot; the latter of whom is not ashamed in public print to deny there can be such a thing as witchcraft.' Reginald Scot died in 1599.

SCOTIA, NOVA. [Nova Scotia.]

SCOTLAND. [Great Britain.]

SCOTLAND. It is now admitted on all hands that we first hear of the Scots as a people inhabiting Ireland, which island they appear in the fifth century to have divided with the Hiberni or Hiberniones, the previous inhabitants, over whom however they gradually acquired so decided a superiority as to be enabled to give their name to the country, which exclusively was called Scotia from the fifth down to the 10th or 11th century.

In the beginning of the sixth century, about the year 503 according to the common calculation, a colony of Scots from the north of Ireland emigrated to North Britain, and effected a settlement in the district now constituting the county of Argyle, to which they gave the name of Dalriada (it is said, from their leader, Riada, Reada, or Reuda). Here they remained for more than three hundred years, during which the rest of the island to the north of the Friths of Forth and Clyde is stated by all the oldest authorities to have formed the kingdom of the Picts, which nation however, although governed by one king, appears to have been divided into two populations, the Northern or Highland Picts, and the Lowland or Southern Picts—the Septentrionales and Australes Picti of Bede.

The history of the kingdom of Dalriada has been preserved in considerable detail by the Irish annalists; and from their account it appears that from nearly the commencement, in 731, of the reign of the Pictish king Angus MacFergus, who was a Southern Pict, there were frequent wars between the Southern Picts and the Dalriads in conjunction with the Northern Picts, till a great victory obtained by Constantine MacFergus, a descendant of Angus, in 789, established the superiority of the Southern Picts, and enabled Constantine, during his long reign of thirty years, to make the monarchy hereditary in his family. His death however coincides with the year 819, in which year the Scots appear to have recovered Dalriada.

Constantine was succeeded by his brother Angus (or Ungust) II., the founder of St. Andrews; he, in 833, by Drust, a son of Constantine; and he by several others, until in 843 we find the whole of North Britain united under the sceptre of Kenneth MacAlpin, originally king of the Scots of Dalriada, but thenceforth styled King of the Picts.

Throughout the 10th century, North Britain, ruled as one kingdom by the successors of Kenneth MacAlpin, appears to have been generally known by the name of Albania, undoubtedly the same with Albion, or Albin. About the middle of this century however we find the name of Scotland beginning to be applied to North Britain; and from the commencement of the 11th century the people of that country are commonly designated

the Scots simply. The Scotland proper of this date comprised only that part of the island which lies to the north of the Forth and Clyde. But the southern part of modern Scotland was occasionally comprised under the same name. It may be divided into three districts: 1, the eastern portion, called Lodonia, or Laodonia, a Teutonic term, signifying the march or border land; 2, the kingdom of Strathclyde, in the north-west; and 3, the district of Galloway, in the south-west.

The Orkney and Western Islands having been taken possession of by the Norwegians in the end of the ninth century, Sigurd, the earl or king of the Orkneys, and Thorstein the Red, who claimed the sovereignty of the Western Islands, made a descent upon the mainland of Scotland in the year 894, and, overrunning Caithness, Sutherland, Ross, and Moray, established there a Norwegian principality, which was given to Thorstein, and was held by him with the title of king of the half of Scotland, till he was defeated and slain, and his followers expelled, by the Scots in the year 900. Caithness however appears to have been reconquered by Thorfinn, earl of Orkney, about the middle of the 10th century. A long succession of wars followed, which resulted in 1034 in the complete subjugation of Scotland as far south as the Frith of Tay, by Thorfinn, the grandson of the original conqueror. The Norwegian kingdom thus founded lasted for thirty years. During that period Macbeth had overcome Duncan, and had assumed the sovereignty of Scotland. Macbeth in the south, and his friend Thorfinn in the north, reigned undisturbed till 1045, when the adherents of the Scottish family rose against Macbeth, under the conduct of Duncan's father, Crinan; but this attempt was soon crushed. His success secured Macbeth nine years more of tranquillity; but in 1054 he was attacked by a Saxon force under the command of Siward, earl of Northumberland, and the result of this invasion was the complete expulsion of Macbeth from the country south of the Friths of Forth and Clyde, and the establishment of Malcolm (surnamed Canmore, or Great Head), the eldest son of Duncan, as king of that part of Scotland. The authority of Malcolm continued to be confined to the Lothians till 1058, when an expedition of Thorfinn, against the English king, drew down the vengeance of Edward upon the Norwegian earl and his ally Macbeth, whom a second Saxon invasion drove as far north as Lumphanan in Aberdeenshire, where he was overtaken and slain in battle. Thorfinn however held his own till his death, in 1064, and even then the people of the north refused to submit to Malcolm, but attempted to set up a king of their own, Donald MacMalcolm, who is styled, like Malcolm II. and Macbeth, Maormor of Moray, and was probably of the same family with them.

The reign of Malcolm Canmore terminated in 1093, and his death gave rise to a new conflict, the population of the Lowlands, now to a great extent Saxon, supporting the claim of Duncan, the natural son of the late king, the Celtic tribes of the north asserting the right of Malcolm's brother, Donald Bane, in conformity with what is called the system of tanistry, which, brought by the Dalriads from their former country, Ireland, had probably till now regulated the succession in the Scotic royal family, both in their first seat and since they had succeeded to the Pictish crown. From this date the elective system, which seems to have been the original constitution of the Pictish monarchy, may be regarded as extinct. With the assistance of William Rufus, Duncan succeeded for a time in overcoming his enemy; but being unable to protect the Saxons who had come to his aid, he found it necessary to send them out of the country, a concession to the popular cry however by which he gained nothing, for as soon as his Scottish subjects found him without foreign protection, they put him to death, and replaced his uncle on the throne. Two years afterwards, another English army, conducted by Edgar Atheling, again overpowered Donald, and set the crown on the head of Edgar, a brother of Duncan. That result decided the contest between the two principles of succession, and also the struggle for supremacy between Celtic and Saxon Scotland.

It was not however till fully two centuries later that the rule of the king of the Scots was completely established over the whole of Scotland. 'On the accession of Edgar,' says Mr. Skene, 'those districts which had formed part of Thorfinn's kingdom appear to have remained in the possession of the native chiefs, who had regained them on the fall of that kingdom; but the rest of the country, consisting of the territories on the north of the Friths of Forth and Clyde, which the Scots had wrested from the Southern Picts, and which had fallen to the royal house founded by Duncan, in addition to the whole of the country south of the Friths, became the absolute property of the king; and here we find the Saxon population and Saxon institutions principally established. In imitation of the Anglo-Saxon kingdom, this part of the country was divided into earldoms, which were bestowed upon members of the royal family; Saxon thanes were introduced over the whole country; sheriffs and sheriffdoms everywhere established; and thus during the reigns of Edgar and Alexander I. the whole of Scotland, with the exception of what had formed the kingdom of Thorfinn, exhibited the exact counterpart of Saxon England. From the reign of Alexander's successor David I. we are to date the introduction of Norman institutions into Scotland. Of the great Highland chiefs, the earls of Moray continued to be the most formidable till 1161, when that ancient line was at length stripped of its power and its possessions by Malcolm the Maiden, and the title it had enjoyed transferred to the earls of Mar. Upon their ruins the earls of Ross rose into eminence, and for some time acquired the ascendancy in the Highlands; but from the time of the cession of the Hebrides by the Norwegians in the year 1266, the most powerful family of the north was that of the Macdonalds, the Celtic chiefs of those islands, who styled themselves Lords of the Isles. The strength of the Macdonalds however, which had been broken by the defeat of Donald, Lord of the Isles, at the battle of Harlaw, fought in 1411, during the regency of

the Duke of Albany, was destroyed by the effective measures taken to curb the Highland chiefs by James I. on his return from England a few years after. From this epoch may be dated the complete reduction of Celtic Scotland under the sceptre of the Saxon king of the Lowlands. The lordship of the Isles was finally extinguished by the forfeiture of the last lord in 1493.

The further details and revolutions of the history of Scotland will be found under the names of the more eminent kings. The succession of the kings from the epoch of the Scottish conquest is as follows:—

A.D.
843. Kenneth MacAlpin, styled Kenneth II.
859. Donald III., brother of Kenneth.
863. Constantine II., son of Kenneth.
882. Hugh, brother of Constantine.
882. Grig, called Gregory the Great.
893. Donald IV., son of Constantine II.
904. Constantine III., son of Hugh.
944. Malcolm I., son of Donald IV.
953. Indulf, son of Constantine III.
961. Duff, son of Malcolm I.
965. Culen, son of Indulf.
970. Kenneth III., son of Malcolm I.
994. Constantine IV., son of Culen.
994. Kenneth IV., surnamed Grim, son of Duff.
1004. Malcolm II., Maormor of Moray.
1029. Malcolm III., son of Kenneth IV.
1033. Duncan, grandson of Malcolm III.
1040. Macbeth, Maormor of Moray.
1058. Malcolm IV. (commonly called III.), surnamed Canmore, son of Duncan.
1093. Donald Bane, brother of Malcolm Canmore.
1093. Duncan, son of Malcolm Canmore.
1095. Donald Bane restored.
1097. Edgar, son of Malcolm Canmore.
1107. Alexander I., brother of Edgar.
1124. David I., brother of Alexander I.
1153. Malcolm V. (commonly called IV.), surnamed the Maiden, grandson of David I.
1165. William the Lion, brother of Malcolm.
1214. Alexander II., son of William.
1249. Alexander III., son of Alexander II.
1286. Margaret, called the Maiden of Norway, granddaughter of Alexander III.
1290. Interregnum.
1292. John Baliol, great-grandson, by a daughter and granddaughter, of David, earl of Huntingdon, younger brother of William the Lion.
1296. Interregnum.
1306. Robert Bruce, great-great-grandson, by a younger daughter, of David, earl of Huntingdon.
1329. David II., son of Robert Bruce.
1332. Edward Baliol, son of John Baliol.
1341. David II. restored.
1370. Robert Stuart, grandson, by a daughter, of Robert Bruce.
1390. Robert III., called John Fernyear, son of Robert II.
1406. James I., son of Robert III.
1437. James II., son of James I.
1460. James III., son of James II.
1488. James IV., son of James III.
1513. James V., son of James IV.
1542. Mary, daughter of James V.
1567. James VI., son of Mary, who succeeded to the crown of England in 1603.

Besides the publications of Innes, Pinkerton, Ritson, Skene, &c., we may mention, as the most important modern works on the earliest period of Scottish history, Gordon's 'Itinerarium Septentrionale,' fol., Lon., 1726; Horsley's 'Britannia Romana,' fol., Lon., 1732; Roy's 'Military Antiquities of the Romans in Great Britain,' 2 vols. fol., Lon., 1793; and Chalmers's 'Caledonia,' 3 vols. 4to., Lon., 1807–24.

The principal of the old native historians are Fordun, Major, Boece, Lesly, and Buchanan, who wrote in Latin between the middle of the 14th and the end of the 16th century; and Lindsay of Pitscottie, Monipennie, and Knox, who wrote in their native dialect in the 16th century; all of whom may be regarded as to a certain extent original or contemporary authorities. To these may be added the poetical or rhyming chronicles of Wyntoun, Barbour, and Blind Harry, which belong to the 14th and 15th centuries, and, amid much legendary matter, contain some facts not elsewhere to be found. The principal histories of ecclesiastical affairs are Archbishop Spotswood's 'History of the Church of Scotland, from A.D. 203 to 1625,' fol., Lond., 1655; Calderwood's 'True History of the Church of Scotland, from the beginning of the Reformation unto the end of the reign of James VI.,' fol., 1678; Wodrow's 'History of the Sufferings of the Church of Scotland from the Restoration to the Revolution,' 2 vols. fol., Edin., 1721-2; and Keith's 'Catalogue of Scottish Bishops,' 4to., Edin., 1755. There are also the curious diaries of Birrel, Bannatyne, Sir James Melvil, the Rev. James Melvil, Spalding, and others, written in the Scotch of the 16th and 17th centuries. Of modern historians, the more distinguished are Dalrymple, Robertson, Tytler, and Sir W. Scott.

Union with England.—The attempts made by England under the first and second Edwards to subjugate Scotland having proved unsuccessful, the notion of an incorporation of the two kingdoms can scarcely be said to have entered into the schemes or contemplations of practical English statesmanship, except on one or two occasions for a moment, till the course of events united the two crowns. As soon as James found himself seated on the English throne, he addressed himself with great earnestness to the bringing about of a legislative union between his two kingdoms. But he was unable to overcome the opposition both of the Scotch people and the English houses of parliament. The first actual union of England and Scotland was affected in the time of the Commonwealth. Five representatives for Scotland and six for Ireland sat among the 144 persons who met on the summons of Cromwell and the Council of Officers, July 5, 1653, and formed what is known by the name of Barebones' Parliament. Cromwell afterwards, in an act or decree issued on his own authority as Lord Protector, April 12, 1654, entitled 'Scotland made one Commonwealth with England,' declared Scotland and its dependencies to be incorporated with England, and pro-

vided that thirty members from Scotland should sit in every future parliament, and accordingly representatives from Scotland (and also from Ireland) sat in the parliaments which met Sept. 3, 1654, and Sept. 17, 1656; but the legality of the decree seems to have been always considered doubtful. The project of a union with Scotland was renewed in the reign of Charles II., and also in that of William III., who in his last message to the House of Commons, Feb. 28, 1702 (five days before his death), in very earnest terms recommended the union to the consideration of parliament. In pursuance of this recommendation, immediately after the accession of Anne a bill was brought into the House of Commons for empowering her Majesty to appoint commissioners to treat with others from Scotland for a union between the two kingdoms, which, although warmly opposed, was in the end carried through both houses by great majorities. A similar act having been passed by the parliament of Scotland, commissioners were appointed for both kingdoms, who met at the Cockpit, Whitehall, London, Oct. 22, 1702. This commission however broke up without coming to terms. Other acts were passed, and a new commission met at the Cockpit, April 16, 1706. Their deliberations were continued till July 22, when the articles were signed and sealed, and on the next day they were presented to the Queen at St. James's. The Scottish parliament was opened for the last time, Oct. 3, by the Duke of Queensberry as high-commissioner. The articles were warmly opposed in debate; many petitions were presented against the measure; and the violence of the Edinburgh populace became so threatening that it was deemed expedient that the parliament should have the protection of a military force; but on Nov. 4, the first article was approved of by a majority of 33 votes; and in the end all the other articles were carried. The last, the 25th, was agreed to Jan. 14, 1707; and on the 16th the Act of Ratification was carried by a majority of 110 against 69.

Meanwhile the English parliament had met on Dec. 3, 1706. The discussion of the articles was commenced in the Commons on Feb. 4; and, after little opposition or debate, the report of the committee, approving of them, without any amendment, was received on the 8th. The subject appears to have undergone somewhat more discussion in the Lords; but in that house too all the articles were approved of by great majorities.

The articles of union, as embodied in this act (stat. 6 Ann., c. 11, or 5 and 6 Ann., c. 8, in the common printed editions), are twenty-five in number. The 1st declares the two kingdoms of England and Scotland to be for ever united into one kingdom by the name of Great Britain, from 1st May, 1707. The 2nd fixes the succession, in default of issue of her Majesty, in the Princess Sophia and the heirs of her body, being Protestants. By the 3rd the United Kingdom is appointed to be represented in one and the same parliament of Great Britain. The 4th gives to all subjects of the United Kingdom full freedom and intercourse of trade and navigation to all places in the said kingdom and the plantations, and a communication of all other rights, privileges, and advantages belonging to the subjects of either kingdom. The next thirteen articles relate severally to shipping, regulations of trade, excise, salt duties, &c., the land tax, stamp duties, duties on windows, duties on coals, the malt duty, the proportion of other duties to be charged on Scotland, further provisions on proportion of charges and application of revenue, the assimilation of the Scottish coin in standard and value to that of England, and the introduction of the English weights and measures into Scotland. The 18th article provides that all laws in use in Scotland, not repealed by the treaty, shall remain of the same force as before, but alterable by the parliament of Great Britain, with this difference, 'that the laws which concern public right, policy, and civil government, may be made the same throughout the whole United Kingdom; but that no alteration be made in laws which concern private right, except for evident utility of the subjects within Scotland.' The 19th article enacts the continuance of the courts of session and justiciary, the admiralty jurisdictions, and other courts of Scotland; provides for the establishment of a court of exchequer there; and authorises the crown to continue a Scottish privy council. The 20th article reserves to the owners all heritable offices and jurisdictions. The 21st guarantees the rights and privileges of the royal burghs. The 22nd regulates the representation of the Scotch peerage by sixteen lords of parliament, and of the shires and burghs by forty-five members of the House of Commons. The 23rd settles the privileges of the sixteen representative peers; and the 24th relates to the rank and precedency of the Lyon King of Arms, the great seal, the privy seal, and the preservation of the regalia and public records of Scotland, which it is declared shall continue to be kept in Scotland in all time coming. The 25th, finally, enacts that all laws of either kingdom, contrary to or inconsistent with the terms of these articles shall cease and become void. The statute also embodies and ratifies an act passed at the same time with the articles, by the Scottish parliament, establishing and confirming the Protestant religion, the Westminster Confession of Faith, and the Scottish church and its Presbyterian church government and discipline by kirk sessions, presbyteries, provincial synods, and general assemblies, as the only government of the church within the kingdom of Scotland, and providing that the universities and colleges of St. Andrews, Glasgow, Aberdeen, and Edinburgh, shall in like manner continue for ever, and that no person shall be admitted to bear office in any of them without subscribing the said Confession, as the confession of their faith; a similar act for the security of the Church of England passed in the same session by the English parliament; and another act passed by the Scottish parliament for settling the election of the 16 peers and the 45 members for Scotland. By the Reform Act passed in 1832, the number of members returned to the House of Commons was increased to 53.

Church of Scotland.—The constitution of this church, in its collective capacity, has been de-

scribed under the head of GENERAL ASSEMBLY. The lowest judicatory in the system, having jurisdiction only over a single parish, is the Kirk Session. There is, or ought to be, a kirk session in every parish, composed of the minister, who is *ex-officio* moderator or chairman, and of the lay elders, who must be at the least two in number. The moderator, as in all the other Scottish church courts, has only a casting vote. In some of the largest town parishes there are as many as fifty or sixty elders; but in most cases the number does not exceed five or six, and the modern practice is for the session to supply vacancies in its number by selections made by themselves. An elder must be resident in the parish at least six weeks in the year. He is elected for life, or so long as he remains qualified to hold the office. Every kirk session is represented by an elder both in the presbytery and the synod, the same member being deputed to both courts, and holding his commission for six months. The ordinary business of the session is to exercise spiritual discipline within the parish, by inquiring into scandals, and punishing delinquencies, which is done by suspension from the benefit of church ordinances, by public or private rebuke, and by pecuniary fines (exacted of course, like submission to the other penalties, only as the price of restoration to communion with the church, for the session has no power to force any person even to appear on its summons). The distribution of the ordinary collections made at the church door for the support of the poor is also in the hands of the kirk session; and the management of all other funds and assessments allotted to the same purpose is conjointly in that body and in the heritors or landed proprietors of the parish. In royal burghs the management of the poor is vested solely in the magistrates; but they usually devolve most of the business upon the kirk session.

It remains to mention chronologically the chief events in the history of the Church of Scotland. The main struggles of the reformation in Scotland date at the middle of the 16th century. On Aug. 1, 1560, a convention parliament abolished the Romish hierarchy, and on Dec. 20, of the same year, the first general assembly was held in Edinburgh. In the ensuing year, the 'First Book of Discipline' was compiled. The fundamental principles of the reformed church were passed into an act of parliament in 1567, and the Presbyterian polity was established by the act of 1592 (c. 114), called 'Ratification of the Libertie of the Trew Kirk: of Generall and Synodall Assemblies: of Presbyteries: of Discipline.' After some hard struggles, Episcopacy was re-established by the parliament of 1612. In 1637 the celebrated Liturgy, concocted by Laud and West, created the convulsions which ended in the civil war and the re-establishment of Presbytery. On the restoration of Charles II. all the acts of the previous reign subsequent to the year 1623 were 'rescinded' or repealed, and consequently the episcopal form of church government was restored; but at the revolution the presbyterian form was re-established. In 1699 lay patronage was abolished by an act of the Scottish parliament. It was re-established by an act of the British parliament in 1710. This act created disputes in the church; it occasioned the secession of 1736, and it was the cause of the great severance in 1843.

The church had for many years previous been divided into two parties, the supporters of patronage, or the 'Moderates,' and the anti-patronage men, or, as they were more lately termed, 'Non-Intrusionists.' In 1834 the latter party obtained the majority in the General Assembly, and on May 31, of that year, the Assembly passed an 'Overture and Interim Act on Calls,' a measure generally known as the 'Veto Act.' The object of this act was to make it a law of the church that no presentee was to be held fit to be ordained as minister of a parish unless he were acceptable to the majority of the parishioners. There was no doubt that it was within the power of the General Assembly to settle what qualifications should be required, in the way of education, character, &c., of every presentee; but the question came to be, whether the church was entitled to require such an external test as the acceptability to the parishioners, and thus virtually counteract an act of parliament under which important civil rights were held. The celebrated Strathbogie case decided the question. Mr. Edwards, on being presented, in June, 1837, to the parish of Marnoch, was vetoed by a majority of the communicants. The presbytery of Strathbogie nevertheless took him upon trial, and inducted him. Then occurred an event from which every one saw that the Church of Scotland must inevitably be split in two. On Dec. 13, 1839, the commission of the General Assembly suspended the majority of the presbytery of Strathbogie from their ecclesiastical functions; and, on May 27, 1841, they made this suspension perpetual by deposing them, and recalling Mr. Edwards's licence as a preacher. In the meantime the Court of Session interdicted the practical application of these proceedings of the ecclesiastical courts. Thus the presbytery of Strathbogie was divided into two bodies—the one supported by the superior ecclesiastical courts, the other by the Court of Session. Both returned representatives to the ensuing General Assembly of 1842, but it was of course only the former who were declared by the Assembly to be duly elected, while the civil court interdicted them from sitting as members of the Assembly.

At the same meeting of the Assembly, in 1842, a vote was carried by 216 to 147, to the effect that patronage ought to be abolished. At the same time the Assembly issued a document, called a 'claim of right,' against the 'encroachment of the civil courts,' which was transmitted to the government, and answered by the Secretary of State for the Home Department, who left no hope in the minds of the non-intrusion party that their demands would be complied with. Some further proceedings having taken place, on the meeting of the Assembly, May 18, 1843, before the roll of members was made up, the late Dr. Welsh read a protest against the constitution of the Assembly, signed by 120 ministers and 73 lay elders. A copy of this protest being left with the clerk of the Assembly, those who had signed it and their

adherents left the Assembly in a body, and constituted in another place 'the General Assembly of the Free Church of Scotland,' choosing Dr. Chalmers as their moderator. On May 23, an 'act of separation and deed of demission' was adopted by the General Assembly of the Free Church, and signed by those who participated in their views. The Free Church are now in possession of numerous churches built by voluntary contributions. They have also founded a college, and are widely extending their operations.

SCOTT, SIR MICHAEL, was born in Scotland, it is generally supposed, in the early part of the 13th century; and he died, by the commonly received account, in 1291. He probably studied at some foreign university, either Oxford or Paris. He is said to have gone to France in early life, to have afterwards proceeded to the court of the Emperor Frederic II., and to have been received with great favour by Edward I. of England; but all the events recorded of his life are either apocryphal, or rest upon unproved identifications of him with persons of the same name, recorded as having taken part in public affairs. Even of the literary works attributed to him, among which are a 'History of Animals' in Latin, said to have been translated from the Arabic of Avicenna, a Latin translation of the works of Aristotle, and some on natural philosophy and alchemy, few or none are incontestably genuine, though there can be no doubt that he was an eminent man in his day. Michael Scott's chief reputation however, after his death, if not in his lifetime, was as a great magician. Even to this day he is traditionally remembered in that character in his own country; and various legends of his wondrous performances are still told, and half believed, among the peasantry, some of which may be found collected in the notes to Sir Walter Scott's 'Lay of the Last Minstrel.' Dante has introduced him in his 'Inferno;' and he is also mentioned by Boccaccio and other writers.

SCOTT, THOMAS, was born at Baytoft, near Spilsby in Lincolnshire, Feb. 16, 1747. He was educated at the endowed school of Scorton, Yorkshire, and in 1762 apprenticed to a surgeon, by whom he was dismissed in about two months for alleged misconduct. He then returned home, where he was employed in rural affairs by his father, who was a grazier. Dissatisfied with this occupation he determined to enter the church, and, with what remained of his instruction at school, a small and imperfect Latin dictionary, and an Eton Greek Grammar, he commenced the study of Latin and Greek with great perseverance. In April, 1772, he communicated his wish to obtain orders to a clergyman at Boston, who, surprised at his proficiency in those languages, recommended him to the bishop of the diocese, by whom he was ordained on Sept. 20, 1772, but, as Scott himself states ('Voice of Truth') with little idea of the responsibility and duties of his office, looking on it only as a pleasant and unlaborious mode of maintaining himself respectably. He was first appointed to the curacy of Stoke Goldington, and Weston Underwood in Buckinghamshire, which he exchanged in 1775 for that of Ravenstone, in the same county. In 1774 his religious feelings were first deeply awakened; his acquaintance with the Rev. John Newton, then curate of Olney, strengthened his convictions, and he earnestly embraced the more Calvinistic doctrines of the Church of England. He soon distinguished himself by his sermons, and by some controversial works. In 1780, on the recommendation of Mr. Newton, he became curate of Olney, and intimate with Cowper and his friends in that neighbourhood. In 1785 he was elected chaplain of the Lock Hospital. In 1788 he commenced his great work, the 'Family Bible, with Notes,' of which the first edition was published in 1796, and by which he was a considerable loser, as he was also by the second edition, much enlarged, published in 1815. In 1801 he was presented to the vicarage of Aston Sandford, in Buckinghamshire. He died April 16, 1821. Besides the 'Commentary,' which has now gone through many editions, the most important of the Rev. T. Scott's publications are—'The Force of Truth; a marvellous Narrative of Human Life;' London, 12mo, 1779; 'A Vindication of the Divine Inspiration of the Holy Scriptures, and of the Doctrines contained in them; being an Answer to the two Parts of Mr. T. Paine's Age of Reason;' 12mo, 1796. 'Bunyan's Pilgrim's Progress, with Notes, and a Life of the Author,' 8vo., 1801. 'Remarks on the Bishop of Lincoln's Refutation of Calvinism,' 2 vols. 8vo., 1812. Many Sermons, separate and collected, and a few minor productions were also published by him at various periods of his life.

SCOTT, SIR WALTER, was born in Edinburgh, Aug. 15, 1771. He died at Abbotsford, Sept. 21, 1832. The history of his early boyhood is the tale of a naturally strong constitution struggling with disease. Before he was two years old his right leg was affected by a disorder that in spite of every care rendered him lame for life; and he had attained his eighth year before he was deemed strong enough to be sent to the high school of Edinburgh. While attending this seminary, and during the first winter of his attendance at college (1784), he enjoyed tolerably good health, but towards the close of 1784 he had a violent attack of sickness, occasioned by his breaking a bloodvessel. In May, 1786, he was sufficiently recovered to commence his apprenticeship as writer to the signet, and his subsequent life was little troubled with indisposition.

These juvenile sicknesses had a powerful influence upon the development of his mental powers. An aunt to whose care he was entrusted when a mere boy, possessed an immense store of legendary tales, which were frequently put in requisition for the amusement of the invalid. During the confinement of his second attack he was allowed to devour the contents of a circulating library, rich in the romances of chivalry and the ponderous folios of Cyrus and Cassandra, down to the most approved works of modern times. The society around him was favourable to the nourishment of his tendency towards romance. His father was a strict disciplinarian, a precision in religion, and a legal formalist; and the usual effects of restraint

were soon manifested in Walter, who read with more avidity what his father scorned as trifling, and hung on the lips of every one who could gratify him with legendary tales.

As he grew in years and in strength, Scott was encouraged by his family, probably with a view to confirm his health, to take long rambles on foot and on horseback through the border and highland counties where his father had relations or clients. He thence acquired an intimate acquaintance with the scenery of his country, and had also opportunities of observing character. He continued also to pay attention to literature. He attended the moral philosophy lectures of Dugald Stewart, and he read essays (in 1792–3) before the Speculative Society. The topics which at that time engrossed the attention of his young contemporaries (among whom were the future founders of the 'Edinburgh Review') were practical, economical, and political discussions. Scott however held on his own way: his favourite themes were the old world; the bent of his mind was historical.

Like most young men addicted to literary pursuits, he had at an early age tried his hand at rhyme. Burns, whom he saw at the house of Professor Ferguson in 1786–7, seems to have made a lasting impression upon him, both by his writings and his personal appearance. His first poetical effort was an imitation of Bürger's 'Lenore;' it was entitled 'William and Helen.' It was published in 1796, together with a version of the 'Wild Huntsman,' from the same author. These were followed by a contribution to G. M. Lewis's 'Tales of Wonder'; it was called the 'Fire King,' and had no great excellence.

It is necessary that we advert to Scott's more active pursuits before closing this retrospect of his probationary years. He was apprenticed to his father in May, 1786. He never however acted regularly as clerk. In 1791 he was admitted by the Faculty of Advocates to his first trials; in 1792 he passed the rest, and was called to the bar. As a member of the Speculative Society and the Faculty, he took an active part in the private business of both bodies. His conduct at this period was marked by an anxious desire to force himself into professional employment, and by that energy which promised success, could he but succeed in making a beginning. He was engaged as counsel for the defendants in several of the prosecutions for riots, seditious practices, and other offences arising out of the political ferment of the day. In December, 1799, he was appointed sheriff of Selkirkshire; and in 1806 one of the principal clerks of the Court of Session. In addition to these sources of income he succeeded to a small landed property on the death of an uncle in 1797, and received a moderate fortune with Miss Carpenter, whom he married towards the close of the same year. In 1799 he published a translation of Göthe's 'Götz of Berlichingen.' He composed and circulated among his friends the ballads of 'Glenfinlas' and 'The Eve of St. John.'

About the beginning of the present century he took his final plunge into literary occupation and avowedly commenced author by profession. His first publication in this capacity was his 'Border Minstrelsy,' which was printed by Mr. Ballantyne of Kelso, in a manner which at once established the reputation of what was for a time rather affectedly called the 'Border Press.' Not long after Mr. Ballantyne removed to Edinburgh, and commenced printer on a large scale, in partnership with Scott.

Scott commenced his career as the most popular poet of his day, in 1805, with the publication of 'The Lay of the Last Minstrel.' This poem was followed in 1808 by 'Marmion;' in 1809, by 'The Lady of the Lake;' in 1811, by 'Don Roderick;' in 1813, by 'Rokeby;' in 1814, by 'The Lord of the Isles.' To these may be added 'The Bridal of Triermain' and 'Harold the Dauntless,' published anonymously, the former in 1814, the latter in 1816. These poems took the literary world by surprise. They were unlike anything that had preceded them. But as the first gloss of novelty wore off, the voice of criticism was more distinctly heard. This, together with the rising star of Byron, determined Scott to leave a field of literary exertion in which he found himself in danger of losing his popularity.

Some time previous to his resignation of the laurel, the success of Miss Edgeworth's pictures of Irish life, had stimulated him to attempt a similar portraiture of the manners and customs of Scotland in a prose imaginative narrative. In 1814 'Waverley' was published anonymously. This book made its way noiselessly and rapidly to a high place in public estimation. In the course of four years it was followed in rapid succession by 'Guy Mannering,' 'The Antiquary,' 'The Black Dwarf,' 'Old Mortality.' 'Rob Roy,' and 'The Heart of Mid Lothian,' all bearing the indisputable impress of the same parent mind. The light half-playfully worn veil of mystery which was preserved with regard to their authorship, served no doubt, to excite the public curiosity and to add a factitious interest to the 'Waverley Novels' at the time of their publication. But their own merits were doubtless the main cause of their success. This new vein of popular applause was worked as sedulously as the former. The novels which from 1818 to 1826 followed those we have enumerated in rapid succession, are of different degrees of merit, but most of them are inferior to the works of the first four years.

Scott's novels and poems however occupied by no means the whole of his time during the thirty years of his busy life, of which they were the luxuriant produce. He contributed to the 'Edinburgh Review' at its commencement, and when differences of political opinion induced him to break off from that publication, he took a warm interest in the establishment of the 'Quarterly.' His trade connections with the Ballantynes, and through them with Constable and other publishers, led him to project many publications, and to take an active part in them as editor or contributor.

From 1796 till 1826 Scott's life was busy and happy, and seemingly prosperous. By the patronage of friends he was rendered independent; by his own exertions he was raised to affluence. The ambition of his life was to enact the part of one

of those feudal lords who were the favourite objects upon which his imagination dwelt. To this was owing the purchase and building of Abbotsford, the strewing of it with 'auld nicknackets,' and the extensive scale on which he exercised his hospitality. The last few years of his prosperity were spent in a gorgeous dream. But the worm was gnawing at the root of his magnificence. Constable, Ballantyne, and Scott were all men of sense and talent, but the spirit of enterprise was stronger in them than that of accurate mercantile calculation. This could not go on for ever: the commercial crisis of 1825–26 precipitated but did not cause the catastrophe.

When what is called in Scotland 'a state of the affairs' of Constable and Co. and Ballantyne and Co. was made up subsequently to the bankruptcy of the two companies, it appeared that Sir Walter Scott was indebted to Constable's creditors, as a partner of Ballantyne and Co., for nearly 72,000*l.*; and that the total amount of the debts of Ballantyne and Co. was about 110,000*l.*, for the whole of which Sir Walter was liable as a partner. About half of the 72,000*l.* due to Constable and Co. being included in the debts of Ballantyne and Co., Scott's actual liabilities were somewhere about 140,000*l.* From 1823, if not from an earlier period, novels had been contracted for and paid in bills, before even the subjects or names of the future publications were fixed. But to the honour of Scott, he did not flinch from the terrible responsibility he had incurred. 'Gentlemen,' he said to the creditors, 'Time and I against any two. Let me take this good ally into my company, and I believe I shall be able to pay you every farthing.' He surrendered the whole of his property; executed a trust-deed in favour of certain gentlemen, who were to receive the funds realised by his labours, and pay off his debts with interest by instalments; sold his house and furniture; retired to lodgings; and resumed his literary labours with dogged resolution.

Scott's works, published during the six years which elapsed between his bankruptcy and his death, possess a painful interest. They want the energy and buoyancy of his earlier writings; they bear the impress of the lassitude of a spirit engaged in a hopeless task. Making allowance however for every drawback, the old fire glows in his ashes. Nor was his self-immolation altogether in vain. His debts, materially diminished before his death, have since been entirely liquidated by the profits of the edition of his collected works. The consciousness of honourable and manly endurance, and the devoted love of his children, smoothed his passage to the grave. He sought, but too late, health in a foreign climate. The worn-out frame craved to be at home and at rest. He murmured, 'now he knew he was at Abbotsford,' when his friend Mr. Laidlaw welcomed him on his return, and for a few days enjoyed the mansion he had reared with so much love and pride. His strong frame struggled hard with the disease, but exhausted nature gave way at last, and he expired after fourteen days of total insensibility.

SCOTT. [Eldon, Earl of; Stowell, Lord.]

SCOTUS. [Duns Scotus.]

SCREEN, in Architecture, a term probably connected with the Latin *Scrinium*, signifies a partition dividing off some portion of an interior or room from the rest of its plan, without shutting up the space over head, a screen being a partition carried up only to a certain height, so as to admit a view beyond it. Screens are exceedingly beautiful internal features in the Gothic or pointed style, in which they were employed for a variety of purposes, not in churches alone, but in halls and other buildings. Great diversity is displayed in them as regards both design and material; for we meet with them sometimes solid or nearly so, at others almost entirely of open-work; of stone or of timber, and occasionally composed of both; but agreeing in being more or less elaborately decorated.

In our English cathedrals the choir is separated from the nave by the *Organ Screen*, which differs from others in being a double screen, so as to form the gallery for the organ above, and to admit of stairs leading up to it, in the space between two partitions.

The *Altar Screen* serves as a back wall to the choir, separating that division of the church from the Presbytery or Lady-Chapel behind it. It was therefore usually solid for the whole height to which it was carried up. That erected by Bishop Fox in Winchester Cathedral is a splendid stone screen decorated with several tiers of canopied niches; and strikingly similar to it in design is the one by Abbot Whetehamstede at St. Albans. Though not so designated, the stalls, &c., form *Lateral Screens*, enclosing the lower part of the choir from the side aisles. The fronts of chantries, small chapels, &c., in churches, may also be described as screens. The examples of this class are very numerous. Among them we may mention that enclosing the monumental chapel of Prince Arthur, son of Henry VIII., in Worcester Cathedral. The tomb of Henry VII., in his chapel at Westminster, is a very gorgeous piece of screen-work, executed entirely in metal, and forming an insulated shrine on a very large scale. Westminster Abbey itself contains many fine studies of screens in its chapels and chantries.

Screens of a different character were employed in the halls of domestic and collegiate buildings, for the purpose of cutting off a passage leading to the butteries and offices. Such screens were almost invariably of oak or other wood, and the space over them and the passage behind served as a music gallery.

Screen is also employed to signify a colonnade or wall architecturally decorated, enclosing a courtyard in front of a building.

SCREW. This mechanical power generally consists of two parts, one of which is a solid cylinder of wood or metal, on whose convex surface is formed a projecting rib or fillet, frequently called a thread, which passes spirally round in such a manner as constantly to make equal angles with lines parallel to the axis of the cylinder. The other is a cylindrical perforation through a block of some material, the surface of the perforation having on it a spiral groove corresponding to

the projecting rib or fillet on the solid cylinder. The first of these parts is called a convex screw, and the other a concave screw. When the two parts are in action, the convex screw, being turned round in the other by a power applied at its surface, moves at the same time rectilinearly in the direction of its axis: occasionally however the convex screw is fixed, and then the other being turned about, it acquires at the same time a like rectilinear motion.

As a mechanical power, the screw possesses the property of an inclined plane. If, for example, it be in a vertical position, and, by a weight at the top of the convex screw acting in a direction parallel to the axis, a point on the under side of a projecting fillet be made to move on the subjacent side of a groove in the concave screw, that point will descend spirally on the inclined plane formed by that side. But, in descending, the point is continually resisted by a force acting in the direction of a tangent to a circle perpendicular to the axis of the screw. Thus the pressure in the direction of the axis and the resistance perpendicular to it are in the same circumstances as the weight of any body on an inclined plane and a power which acts in a direction parallel to the base of the plane; that is, in the case of equilibrium, as the base of the plane is to its height; or, as the circumference of the convex screw is to the distance between the threads, in a direction parallel to the axis.

In practice, a lever or wheel is always fixed perpendicularly to the axis, and the moving or sustaining power is applied near the outer extremity of the lever, or at the circumference of the wheel. In this last case, the ratio between the moving-power and the resistance is as the distance between the threads of the screw is to the length of that circumference. The friction of a screw is however very great, and is frequently equal to at least the weight supported, for it will prevent that weight from descending when the moving-power is taken away.

An *Endless Screw* consists of two or more spiral fillets or threads on a rod which is capable of being turned on its axis by a power applied to the handle of a winch, or to a string passing over the circumference of a pulley attached to the rod. The threads work between teeth on the circumference of a wheel, so that, while the revolution of the rod continues, the wheel turns on its axis.

A *Double-Threaded Screw* is one in which a fillet is formed upon each of two continuous spiral lines on the surface of the cylinder; the two making equal angles with lines parallel to the axis. With apparently an equal distance between the threads on both screws, the power of the single-threaded screw is double that of the other.

From the high ratio which the resistance bears to the moving-power in the screw, the use of this machine for moving or compressing bodies is very great; it is also extensively employed in the construction of philosophical instruments for measuring small angles or distances. [MICROMETER.]

A *Differential Screw* consists of one convex screw which works in the interior of another convex screw. The latter works in a concave screw, which is fixed; and the former is capable of moving in a rectilinear direction only, being prevented from turning on its axis with the rotation of the exterior screw. Also the number of threads in an inch on the convex surface of this last is less by one than the number in an inch on the convex surface of the other. Thus, if the exterior screw have 100 threads in an inch, and the interior screw 101 threads, then one turn of the machine will cause the latter to move through the very minute extent of $\frac{1}{10100}$ inch, and this space may be further subdivided by means of a micrometer head applied to the exterior screw.

Manufacture of Screws.—In the infancy of screw-making the thread was formed with a file; but this process has long been superseded by the use of dies and cutters, which are applied in various ways. The cutting of the worm is sometimes performed in a lathe, the blank being fixed in a chuck, and projecting during its revolution between a pair of stationary cutters; the longitudinal motion of the blank, and consequently the size or inclination of the thread, being determined by a regulating or pattern screw attached to the mandril, which must therefore be changed for every different degree of fineness; while the shape of the thread or worm depends on the form and position of the cutters. Small screws are frequently wormed by a similar apparatus turned by a winch-handle attached to the mandril; and sometimes by means of a steel tap-plate. Many patented improvements have been introduced in this manufacture, chiefly in relation to the cutting of the worm. Several attempts have been made to produce screws by casting; but not with much success.

Screw-Bolts and other screws for working in metal are manufactured in a similar manner to common screws when the number required is sufficient to justify the expense of adjusting the machinery. When this is not the case, they are, if small, often cut by hand, without the aid of a lathe. In the screwing of metal work, there are required two portions, the external and the internal screw: these require contrary processes in their manufacture.

In cutting screws in wood, an internal wooden screw is cut by an external screw of iron or steel, and an external wooden screw by an internal screw of iron or steel: the cutter or *tap* being shaped according to the kind of screw to be produced.

The large iron screws used in vices, presses, waggon-jacks, &c., are sometimes formed by means of dies, turned with immense power by very long levers; the thread being made without cutting, by indenting and squeezing up the metal. The very best scrap-iron is required for the screws formed in this manner, on account of the twisting force to which they are subjected.

In the ordinary method of cutting screws in a lathe, the size of the worm, or the distance between the threads, is regulated by a pattern screw, and cannot be varied from it; but an ingenious machine is used in the Woolwich dockyard for cutting a great variety of different screws from one pattern.

SCREW OF ARCHIMEDES. The inventor of the machine so called is quite unknown, but both Diodorus Siculus and Athenæus ascribe the origin of it to the philosopher of Syracuse. The former relates ('Bibl. Hist.,' lib. i., c. 34) that irrigation was facilitated in Egypt by a certain machine invented by Archimedes of Syracuse, and called Cochlias (κοχλίας) from its form; and the latter states ('Deipnosophistæ,' lib. v., p. 206, Casaub.) that Archimedes invented it for the purpose of removing the water from the hold of the great ship which was built by King Hiero of Syracuse. Vitruvius ('De Architecturâ,' lib. x., c. 11) describes the machine under the name of cochlea. He says that it consisted of four or eight laths bent spirally and fixed at one edge against the axle, so as to form as many winding channels about it; and that the whole was covered by a cylindrical case, formed of planks, nailed over the exterior edges of the laths. The lower extremity was immersed in the water, which, rising along the channels by the revolution of the machine on its axis, was discharged at the upper extremity. Such a machine has been occasionally, in modern times, employed to draw water from docks, basins, &c.

SCREW-JACK, a portable machine for raising great weights by the agency of a screw. The apparatus introduced under the name of the Universal Screw Jack is particularly useful on railways, where it affords a simple means of lifting a carriage or engine that may have run off the rails, and then moving it laterally until the wheels are in their proper position over the rails.

SCREW-PRESS. In the common Screw-Press the articles to be subjected to compression are laid upon a horizontal bed, forming the base of a strong frame, in the upper cross-bar or *head* of which a nut is firmly secured. The screw works up and down in this nut, and to its lower end is attached the *follower*, or moving piece which presses on the upper surface of the substance operated upon. The connection between the screw and this piece is such that the follower rises and falls, but does not turn round with the point of the screw; and the steady motion of the follower is provided for by making it fit closely to the side-pieces or cheeks of the press, which therefore act as guides. The screw is turned by a long iron lever. The screws of presses were formerly made of wood, but they are now almost uniformly made of iron.

While the diminution of the size of the thread affords the means of increasing the power of a screw-press, by reducing the distance traversed by the point of the screw during each revolution, it is attended with the serious disadvantage of diminishing its strength. This difficulty may be avoided by the use of a double or differential screw, the principle of which is explained in the article SCREW.

SCREW-PROPELLER. [STEAM-VESSEL.]

SCRIBES. The word which is translated 'scribe' in the English Bible signifies 'a writer.' It was applied to an officer of the king, or as we should say, a secretary of state. (2 Sam., viii. 17; xx. 25; 2 Kings, xxii. 3.) It was also used to signify men learned in the Jewish Scriptures. (Ezra, vii. 6, 11.) The last was the meaning which the word came to have in the later ages of the Jewish state. The office of the scribes was to explain the law. They had seats in the Sanhedrim, and were generally Levites. In the time of Christ they appear to have been for the most part Pharisees.

SCRIPTURE. This word means simply a *writing* (*scriptura*), but it has long been used to designate the sacred books of the Old and New Testament.

SCRO'FULA, or SCRO'PHULA, the technical name for the disease that is popularly called the *King's Evil*. This old English name commemorates the virtues of the *royal touch*, to which, from the time of Edward the Confessor till the reign of Queen Anne, multitudes of persons afflicted with scrofula were subjected. A similar custom prevailed in France; and miraculous powers for the cure of scrofula were likewise claimed for different Romish saints, for the heads of certain noble families, for a seventh son, and for many consecrated springs.

This complaint was well known to the ancients. It is mentioned by Hippocrates, Celsus, Galen, and others.

Scrofula is defined by Dr. Good ('Study of Medicine') to be, 'Indolent glandular tumours, frequently in the neck, suppurating slowly and imperfectly, and healing with difficulty; upper lip thickened; skin smooth; countenance usually florid:' which agrees almost exactly with the definition given by Cullen in his 'Nosology.' A soft, brittle, unorganised matter, resembling curd, or new cheese, is found mixed with the contents of scrofulous abscesses, or deposited in rounded masses of different degrees of firmness, varying in bulk from the size of a millet-seed to that of a hen's egg. To the rounded masses of this substance the name of tubercles has been assigned, and the substance itself is called tuberculous, or tubercular matter; and the presence of this matter is regarded as the most certain evidence of the existence of the disease.

Scrofula, though not a contagious disease, is unquestionably hereditary; and hence very generally dependent upon a peculiar diathesis. Yet, like many other hereditary diseases, it is also occasionally generated as a primary affection, without any hereditary taint that can be discovered. When it occurs as a primary or ingenerated affection, it is by no means always limited to any particular temperament or habit of body. But where scrofula appears hereditary, and especially where it does not show itself very early, it is often accompanied with a peculiar constitution. When scrofula originates in the healthy offspring of healthy parents, it is always under certain circumstances, the principal of which are habitual exposure to cold and damp, privation of free air and light, and want of healthful exercise.

The treatment of scrofula naturally divides itself into the preventive and the curative; the former of which is the more generally successful, and obviously the more important. Nutritious

diet, pure air, warm clothing, and proper exercise are the great means of securing the first object.

Tonics are amongst the most valuable remedies in the constitutional treatment of scrofula. Of these, cinchona is perhaps the most efficacious, and, from the concentrated form in which it can now be exhibited (viz. the disulphate of quina), the most generally available. Other vegetable tonics and bitters have been administered with advantage in scrofula, such as calumba, gentian, and hop. Of the metallic tonics used in scrofula, iron is that which has been found the most beneficial. Iodine, as prescribed by Lugol, is also a valuable remedy.

The local treatment must be adapted to the local symptoms which are presented.

SCROPHULA'RIA, a genus of plants belonging to the natural order *Scrophularineæ*. *S. peregrina*, Figwort, is the γαλιόψις of Dioscorides, 4. 95. *S. nodosa* has leaves, which when bruised are said to be purgative and emetic. They have a bitter taste and a disagreeable smell. It is native mostly throughout Europe. *S. aquatica* is called Water Betony, Bishop's Leaves, and Broadwort. Its medicinal properties are the same as those of *S. nodosa*. There are seventy-three species of Figwort, of which six are recognised British plants.

SCROPHULARIA'CEÆ, a natural order of plants belonging to the dicarpous group of Monopetalous Exogens.

The *Scrophulariaceæ* are very widely diffused over the surface of the earth, being found in the whole range of climate between the coldest point at which vegetation occurs at the poles, and the hottest parts of the tropics. In the torrid zone of both worlds they are very abundant, and form a twenty-sixth part of the flowering plants of Europe and a thirty-sixth of those of North America. In Australia and New Zealand they are common, and the barren shores of Tierra del Fuego produce several species. *Scrophulariaceæ* are in general suspicious plants. Several of them are active poisons, and though all do not possess deleterious properties, they are all more or less acrid. Some are esculent, but they require great caution in their preparation as food. Many of the species are used in medicine. The *Digitalis purpurea*, or Purple Foxglove, has a powerful influence on the system and is a valuable remedy in some diseases. *Gratiola officinalis*, the Hedge Hyssop, is also an active medicine.

SCRUPLE (*scrupulum*, diminutive of *scrupus*, a term for a sort of pebble, probably used in counting) is now used only as the third part of a dram, or the twenty-fourth part of an ounce, in the apothecaries' division of the troy pound. It was used originally as the twenty-fourth part of the Roman uncia; afterwards as the sixtieth part of an hour, or what is now called the minute. The sixtieth part of a minute was called scrupulum secundum, the sixtieth part of a scrupulum secundum was scrupulum tertium, &c., whence our terms second, third, &c., applied to the sexagesimal divisions of the minute. It may be worth while to add that the scrupulum is described by lexicographers as a small pebble, such as found its way between the sandal and the foot, whence the use of the word to denote a difficulty or objection.

SCUDE'RI, GEORGE DE, was born about 1601, at Hâvre in Normandie, of which place his father was governor. Young Scudéri was brought up by his father to the profession of arms, but he quitted it about 1630 for that of a dramatist. He was regarded by many as equal to P. Corneille, with whom he was on terms of intimacy, till the success of 'The Cid' threw Scudéri into the shade, and caused a feeling of envy, to which he gave vent in 'Observations sur le Cid,' Paris, 1637. In 1641 or 1642 Scudéri was appointed governor of Notre Dame de la Garde, a small fort situated on a rock near Marseille, where he went to reside, but soon returned to Paris. In 1650 he was elected a member of the Académie Française. He died at Paris, May 14, 1667.

In the period from 1631 to 1644, Scudéri produced sixteen plays. He also wrote 'Poesies Diverses,' Paris, 1649, 4to., and 'Alaric, ou Rome Vaincue,' Paris, 1654, folio, an heroic poem, and a few other works.

SCUDE'RI, MADELE'NE DE, the sister of George de Scudéri, was born in 1607. She is the authoress of several voluminous romances which had an extraordinary reputation:—'Ibraham, ou l'Illustre Bassa,' Paris, 1641, 4 vols. 8vo.; 'Artamène, ou le Grand Cyrus,' Paris, 1650, 10 vols. 8vo.; Clélie, Histoire Romaine,' Paris, 1656, 10 vols. 8vo.; 'Almahide, ou l'Esclave Reine,' Paris, 1660, 8 vols. 8vo. Besides these, Mademoiselle de Scudéri wrote 'Celinte,' 1661, 8vo.; 'Femmes Illustres, ou Harangues Heroïques,' 1665, 12mo.; 'Mathilde d'Aguilar,' 1669, 8vo.; 'La Promenade de Versailles,' 1669, 8vo.; 'Discours de la Gloire,' 1671, 12mo.; 'Conversations sur divers Sujets,' 1684, 2 vols. 12mo.; 'Conversations Nouvelles,' 1684, 2 vols. 12mo; 'Conversations Morales,' 1686, 2 vols. 12mo.; 'Nouvelles Conversations de la Morale,' 1688, 2 vols. 12mo.; 'Entretiens de Morale,' 1692, 2 vols. 12mo.; 'Nouvelles Fables en Vers,' 1685, 12mo.; besides a great number of 'Vers de Société,' addressed to her contemporaries.

Mademoiselle de Scudéri died June 2, 1701.

SCUDO. [MONEY.]

SCULPTURE, in its strict sense, is the art of carving or cutting any material into a proposed form or shape. In its more general acceptation it is the art of representing objects by *form;* and is thus applied to carving, modelling (or the plastic art), casting, whether in metal or other materials, and to gem-engraving. Sculpture is practised in various ways; namely, in forming entire or insulated figures, as statues or groups, called, in technical language, 'the round;' or in representing objects more or less raised without their being entirely detached from a background. This latter is termed 'relief,' and the degrees of relief are defined by modern writers and artists by the expressions *alto-rilievo*, when the object is so salient as to be nearly round; *basso-rilievo*, when it is slightly raised from the background; and *mezzo-rilievo*, when a medium is preserved between the extremely high and the very flat relief. There is another variety of this manner

of working 'basso-rilievo,' which is only or chiefly found in Egyptian sculpture; the outline is sunk into the plane or ground, and the parts are then formed and rounded on the principle of basso-rilievo. By this mode of working there is usually no projection beyond the profile or face of the original ground; to gain effect therefore in this kind of *relieved intaglio*, the Egyptian artists frequently painted the sculpture.

The materials for modelling used by the ancients, were clay, wax, and plaster. The clay model was usually baked, by which it acquired a hardness scarcely inferior to stone. These *terra cotta* works were generally painted.

The materials used for carved works comprised every substance, hard or soft, that could by any possibility be employed for the purpose. The Egyptians, whose great object was to render their works durable, chiefly employed porphyry, basalt, and granite. For casting—gold, silver, copper, lead (and their compounds), wax, and plaster, were all used. [Bronze; Founding.]

Polylithic Sculpture was the name given to the combination of different marbles in the same work. When painting or colouring was resorted to, it was called *Polychromic Sculpture*. This mixture of materials is scarcely reconcileable with modern taste, neither is the introduction of foreign substances—metal, precious stones, paste, or glass, for eyes in statues and busts.

There was a very peculiar combination, rather referred to than described by ancient authors, by which shades or tints of colour were produced. Plutarch ('Symp.,' lib. v.) says that the sculptor Silanion made a statue of Jocasta, the wife of Laius, king of Thebes, in which she was represented dying. To increase the intensity of the expression of the countenance, the artist, by an ingenious mixture of the metals of which the statue was composed, had produced a pallid appearance. This, he says, was effected by the addition of silver.

Sculpture seems to have originated in idolatry; although it is probable that the first images, or statues, were of men rather than of gods. The exploits of heroes and great men led in all probability to the first attempts at making portraits and images; and the admiration of a superstitious people became gradually heightened into veneration, awe, and worship. The oldest idols of Egypt, no less than the monstrous images of the Buddhists and Chinese, were probably the fruits of such an origin. No remains of Hebrew sculpture are known; but as early as the time of Moses they had attained to a considerable proficiency in some of the most difficult processes of art. The setting up of the molten calf, and the making of the brazen serpent, are evidence of this. The earliest recorded names of sculptors are in the Old Testament; Bezaleel the son of Uri, of the tribe of Judah, and Aholiab the son of Ahisamach, of the tribe of Dan. (Exod., xxxv.) They were the artists appointed to make the ornaments of the Tabernacle, and their date is therefore about fifteen hundred years before the Christian æra. The remains of Assyrian sculptures which have recently been brought to London and are deposited in the British Museum, have made a great addition to our knowledge of the manner in which these arts were practised by the Assyrians during a period of which there is no distinct historical record. [Nineveh.]

Sculpture was practised in Persia with very limited success, owing chiefly to the Persians being fire-worshippers. The designs which decorate the structures at Persepolis represent religious processions chiefly, and sometimes combats of men and beasts. In Egypt, on the other hand, distinct as is the quality of its art from that of Greece, sculpture was practised on a scale and for purposes that give it an irresistible claim to our interest.

It has been variously attempted to distinguish different periods or epochs in the history of Egyptian sculpture; but the only division which is not open to dispute, is first, that of an original and preserved standard, which, with slight variations and modifications, existed from the earliest date of art in the country down to the time of the arrival of the Macedonian Greeks in Egypt, that is, till about 330 B.C. The Greek dominion in Egypt constitutes the second period; and the style of art may perhaps not inappropriately be called Greco-Egyptian. The next and last period may be termed the pseudo-Egyptian, or imitative period, and dates from the time of Hadrian, or about A.D. 130, when the Romans adopted many of the superstitions of the Egyptians, and added some of their divinities to their own extensive mythological calendar. The little progress in art made by the Egyptians is sufficiently explained by the religious veneration for ancient usages preserved and enforced by the priests, who, Plato tells us, 'never suffered any painters or statuaries to innovate anything, or to invent any new subjects or any new habits. Hence the art remained the same; the rules of it the same.'

Etruscan Sculpture is the next school that claims attention. The history of this nation is involved in great obscurity. The appellations of Tuscan and Etruscan were foreign to them, and Etruria was a Roman term. Even in ancient times it was disputed whether the Etrurians were Pelasgians from Greece, Lydians from Asia, or indigenous in Italy; and modern antiquaries have added to these speculations their conjectures as to a Phœnician, an Egyptian, and a Celtic origin. An examination of their sculpture, as founded on the numerous existing monuments, almost seems to connect them, in a greater or less degree, with the Greeks. At the same time it must be remembered that such resemblance is nothing more than the characteristic of all art in its infancy. This is the view taken by Lanzi in his observations on similarity of style, and in combating the conjecture that Etruscan art had been derived from Egypt. Lanzi also observes, in speaking of the sculpture of this school ('Notizie sulla Scultura degli Antichi'), that a distinction must be made between works in the Etruscan style and works simply executed by Etrurian artists. The 'Etruscan style' was a peculiar manner of treating art. It was designated by the Latins 'Tuscanicus;' and all works executed in this manner were termed 'Opera Tuscanica' or 'Signa Tuscanica.'

The peculiar characteristics of the Etruscan style, the *Signa Tuscanica*, are an affectation or exaggeration in the general actions and attitudes, and meagreness of treatment in the details. Many points of resemblance to the Etruscan style appear in early Greek art, especially that of the *Æginetan School*. With these however this indication of primitive style passed away as the knowledge of art advanced, while the Etruscan manner was retained, and even imitated in many works of a much later period than the original Tuscan, and by artists belonging to schools of a more perfected taste. It is worthy of remark, as accounting perhaps for the distinctive character of Etruscan art, that Etruria, like Egypt, was ruled by a powerful hierarchy. Their chiefs, *Lucamones*, were priests as well as temporal rulers, and they, like their Egyptian brethren, may have exercised some influence in directing art, and in preserving from innovation the forms once consecrated by religion. The Etruscans were famed for their vases, the peculiarities of which varied in different towns. There is however reason to believe that a great number of painted *terra cotta* vases are the work of Greek artists.

Greek Sculpture.—In Greece, as in other countries, the earliest attempts at imitative art were extremely rude. The history of Greek sculpture may be divided into four periods. The first period embraces all the uncertain age, of which little is known but from tradition. It may be considered to extend to the commencement of that great change in the style of art which had its consummation in the school of which Phidias was the head. The second division includes the period during which sculpture was practised in the grand or sublime style, and during which the scholars of Phidias executed their works upon his principles. The third period is characterised by a more rich and flowing style of execution, as well as by the choice of softer and more delicate subjects, the beautiful rather than the sublime. Praxiteles may be considered the first sculptor who introduced this sensuous style of art; and Lysippus contributed to advance it by the peculiar fulness, roundness, and harmonious general effect by which his works seem to have been characterised. The fourth and last period is that of the decline of sculpture, when, although the excellence of preceding schools was still admitted and maintained, grandeur of style gave place to littleness, and the beauty and simplicity of general form and character was lost in individuality and minute detail.

The remains of Greek sculpture of the archaic period are interesting to the antiquary, but they offer very few attractions to the lover of the beautiful. Rigid and stiff in action, and rude and inelegant in form, the statues and rilievi of the infancy of Greek sculpture have very little to distinguish them in these respects from the earlier attempts of other nations. The first step towards a change was in the attempt to give action; and this was soon attended by fresh peculiarities of shape or figure in the parts. In this stage it will be observed that there is great energy or violence in the general design, with a lumpy or knotty character of form.

The first sculptors whose names are recorded are Dædalus, Smilis, and Endoeus. It is scarcely possible to establish a fixed date for the first of the above-named artists, and indeed to distinguish how many persons were so called. The earliest person called Dædalus was descended, according to the ancient traditions, from a royal stock, being grandson of Erectheus, king of Athens. He is said to be the first sculptor who ventured to separate the legs of his statues. He also was the inventor of the saw, the axe, lever, &c. Dædalus seems also to have been a general title for some time, given to any distinguished mechanist or figure maker.

About 869 B.C. Phidon of Argos is said to have struck the first money in Greece, in the island of Ægina. Some rude and simple coins of that island are extant; the device is a tortoise; and from their primitive style, they are thought to be not very remote from the period alluded to. It has been supposed that the employment of metal for sculpture took place soon afterwards.

Among the sculptors recorded in the annals of art is Gitiadas of Sparta, of whom there were works remaining at Lacedæmon at the time of Pausanias (lib. iii., 17). Gitiadas exercised the profession of architecture as well as sculpture. Learchus also, a sculptor of Rhegium, is placed about this date. Much of the difficulty in classifying the artists of this time arises from the uncertainty that chronologers have felt in fixing the period at which Dipœnus and Scyllis flourished; but the date here given to Learchus must approximate nearly to the time at which he lived. The next names of importance that occur in the history of art are Telecles, Rhœcus, and Theodorus, to whom sculpture seems to have been indebted for various and great improvements.

Some antiquaries place Dipœnus and Scyllis between 800 and 700 B.C., a date which Flaxman (‘Lectures,’ p. 75, 79) adopts in speaking of these sculptors. Others supposed they lived as late as 540 B.C. They have been called the first artists who employed marble for sculpture (Plin., ‘Hist. Nat.,’ xxxvi. 4), but it is more likely that the expression upon which this opinion has been founded means that they were eminently distinguished for their skill (which may have been extraordinary at the time) in working in that beautiful material. Dipœnus and Scyllis were considered the founders of the school of Corinth.

From the earlier time of which mention has been made, down to about 550 B.C., there probably was little change in the style of sculpture, after which the progress was rapid and uninterrupted.

Up to the period at which we are now arrived sculpture seems to have been practised most generally and successfully in the Greek colonies of Asia; but the consequences of the revolt against Darius, the son of Hystaspes, were utterly destructive to their further progress. Many of the temples were burnt by the Persians, and the inhabitants were carried to distant places, or were reduced to a state of slavery. But as art fell in Asia, it acquired vigour in Europe, and the artists of Ægina, Sicyon, and Corinth, diffused the principles of good taste and the knowledge of art

throughout neighbouring countries; and a feeling for a grand style of sculpture was soon generally exhibited. From about 500 B.C. the succession of the great sculptors of Greece, and the changes that each master and his school effected in the style of art, can be traced with tolerable accuracy. Sicyon and Ægina were the most celebrated schools of sculpture, and unrivalled for the high quality of their bronzes. After Callo, or Callon, a sculptor whose date is very uncertain, the Æginetan artists of the greatest celebrity seem to be Glaucias and Onatas. These artists were much employed by Gelon, the tyrant of Syracuse, and his successors. Onatas, the scholar of Tectæus and Angelion, enjoyed a high reputation, and, judging from the numerous works which Pausanias attributes to him, must have had extensive employment.

The defeat of Xerxes gave a great impetus to Grecian art, by enabling the Greeks to devote vast sums to its cultivation and encouragement. The ample employment thus afforded for their talents, and the high purposes for which their works were destined, excited a noble spirit of emulation among the artists, whose minds seemed to expand with the greatness of the objects required of them.

The gradual improvement of style in art, from the archaic period, and through the early Æginetan and Athenian schools, is traced by some of the ancient writers. 'The works of Callon,' Quinctilian says ('Orat. Instit.,' xii. 10), 'with those of Hegesias, are hard, and approached what was distinguished as the Etruscan manner. Calamis was less rigid, and the style of Myron, who followed, was still more softened.' The chief sculptors of this age were Hegias, Pythagoras, Ageladas, Myron, Polycletus, Phidias, Alcamenes, and others. [Alcamenes; Myron; Phidias; Polycletus.]

Pliny distinguishes at least three statuaries named Pythagoras, but it appears probable that there were only two of very high reputation. The most celebrated was a native of Rhegium, and the scholar of, or, more correctly speaking, of the school of Clearchus. (Paus., vi. 4.)

The most perfect productions of these brilliant days of sculpture were executed by Phidias. The Elgin Marbles at the British Museum enable us to judge to some extent of his excellence. [Elgin Marbles.] The scholars and followers of Phidias were Agoracritus of Paros, Alcamenes of Athens, Colotes or Colotas, Pæonius, and others. Agoracritus was the favourite scholar; Alcamenes, judging from the accounts left of him, the most able artist.

The sculptures of Phigalia, consisting of a series of alti-rilievi, representing the battle of the Lapithæ and Centaurs, and of the Greeks and Amazons, are of this age. The influence of Phidias continued to be felt for some time. Art had gradually been relieved from the dryness and hardness of the Æginetan school, and Phidias produced out of it the grand character which marks his period; but it seems there was still remaining a severity, both in forms and treatment in the works of some of the artists of this school, which was reserved for a sculptor of another age to remove. The great originator of the new school was Praxiteles. [Praxiteles.] The grand, the sublime, and the severe, now gave way to the soft, the flowing, and the graceful.

Millingen tells us that all statues of female divinities were anciently draped 'and that Praxiteles was the first who represented Venus naked.' (Millingen, 'Monuments,' x., p. 7.) Such an innovation was considered extremely indecorous; but it was excused in this instance, on account of the beauty of the performance. The sculptors of this period (about 350 B.C.) followed the style of Praxiteles, and the new school became established.

The next name of importance, as the leader of a school, is that of Lysippus of Sicyon. [Lysippus.] Lysippus left several scholars, three of whom, his sons Daippus or Laippus, Bedas, and Euthycrates, are mentioned amongst the most eminent of his successors. There is a fine bronze statue of Hercules in the Townley Gallery in the British Museum, which has every indication of being of this school.

The perfection of sculpture seems to have been attained under Praxiteles and Lysippus. They were contemporary, and each effected in his way what was before wanting to its completion. It is believed that there are imitations of some of the works of Praxiteles in the various modern collections of sculpture. Among these are the Sleeping Fawn, at Munich; the Cupid of the Vatican, at Rome; statues of Venus, believed to be copies of the far-famed Venus of Cnidus; and the Apollo Sauroctonus, at Rome.

The death of Alexander the Great (B.C. 324) was followed by the dismemberment of his vast empire. The arts suffered in some measure by these divisions and contentions; but it is difficult to assent to Winckelmann's opinion, that after the death of that prince there was nothing left except a class of mere imitators. Each of the artists above mentioned left numerous scholars, who still preserved the high character of sculpture by their own successful practice. Among the most distinguished of these sculptors are Cephisodotus and Eubulus, the sons of Praxiteles; Pamphilus, his scholar; the before-mentioned Daippus, Bedas, and Euthycrates, the sons of Lysippus, and Tisicrates, his scholar; Xenocrates, who also wrote a treatise on his art; Chares, the Lyndian, the artist of the famous Colossus of Rhodes; Dameas, Eutychydes, and Phœnix. Hermocles of Rhodes is mentioned as having been employed by the earlier Seleucidæ. Isigonus, Pyromachus, and Stratonicus illustrated by their art the victories of Attalus and Eumenes over the Gauls; and the Ptolemæi also for a time were protectors and patrons of artists.

The fatal blow to the arts in Greece was given by the success of the Roman arms. Lucius Mummius had been sent by the senate against the Achæans. He engaged the Greek army near Corinth, and completely defeated it. The city was immediately devoted to destruction, and sacked by the conquerors. The Romans carried away from this celebrated seat of the arts, as well as from the other cities of Greece which fell into

their hands, the greater part of the fine productions both in painting and sculpture, which had been accumulated for centuries. These were forthwith transported as spoil to Rome, which became filled, for the first time, with the most splendid monuments of Grecian taste and genius. This event occurred in the 158th Olympiad, or 146 B.C. Having vainly endeavoured to impede the progress of the Roman army, Athens had to submit to what she might fairly consider a barbarian conqueror. In 86 B.C. she received as her master the haughty and unrelenting Sulla. The history of ancient sculpture in Greece may be said to close at this time. After the establishment of the Roman Empire the Greeks no longer had either the higher inducements or the means to carry on the exercise of the arts in what may be considered their native country; and their professors were driven to seek employment and an asylum among their conquerors.

Roman Sculpture.—It is not easy to determine when the Romans first began to pay attention to art. The sculpture mentioned as existing in Rome at a very early date was no doubt the production of their neighbours the Etrurians. It is recorded that after the victories of Mænius and Camillus over the Latins, about 350 B.C., equestrian statues were erected in their honour. In the third century, B.C., one of the Fabii devoted himself to the arts, and acquired from his success the surname of Pictor. The Romans now began to seize the collections of conquered countries; but it was not until the rapacity of Sulla had accumulated an enormous number of Grecian sculptures that any taste for the art was evinced by the Romans. The taste however having once been excited, it became a passion among the Roman nobility to form collections of works of art. In the last century before Christ various sculptors of distinguished name were resident in Rome. Among these we may particularly mention Pasiteles, Arcésilas or Arcesiláus, Saurus, Bátrachus, Strongylion, Olympiosthenes, and Evander. C. Julius Cæsar gratified his taste for the fine arts by collecting statues, gems, and similar objects; and a great impulse was given to the encouragement of sculpture by Augustus, who caused all the finest available works to be collected, and placed in the public places of Rome. Among the most liberal patrons of this period Agrippa stands pre-eminent for the munificence with which he devoted his fortune to the embellishment of Rome. The Pantheon is a monument of the taste and liberality of a Roman citizen. Tiberius contributed greatly to nourish a taste for art. Caligula, too, had works of art brought from Greece to Rome; but in this he seems to have been actuated by the most paltry vanity, for he ordered the heads of gods and illustrious men to be struck off their statues, and his own to be substituted, hence the mutilation of so many of the great works which have reached our times. The reigns of Claudius and Nero first gave real promise of encouragement to the arts. Nero required decoration for his Golden Palace, which he constructed on the Palatine Hill; and although the vast number of works that had already been procured from Greece would seem to have robbed that country of all its treasures, he procured no fewer than five humdred bronze statues from the temple of Apollo at Delphi. Two of the best works of ancient sculpture, the Apollo Belvedere and the so-called Fighting Gladiator were found among the ruins of a villa or palace of Nero at Antium. Zenodórus the sculptor was employed by Nero to make a colossal statue of him, of bronze. One account says it was 110 feet high; another, 120. (Plin., 'Hist. Nat.,' xxxiv., 18; Suet.,' 'Ner.,' 31.) Menodórus, an Athenian sculptor, lived at this time. His statues of athletæ, and subjects of that class, are mentioned in terms of commendation. It is probable that there were two artists of this name.

This may be considered the period at which the introduction of variously-coloured marbles in statues became the fashion in Rome. The Romans imitated the different stuffs of which the draperies were composed, and even sometimes went so far as to express, in white and dark marble, the colours of the eyes in a statue. The reigns of Otho, Galba, and Vitellius were too short and too disturbed to give those emperors time or opportunity to encourage sculpture. Busts of these emperors are extremely rare. Vespasian, Titus, and Domitian encouraged sculpture.

The reigns of Trajan, Hadrian, and the Antonines may be considered the golden age of sculpture in Rome; though even then it is probable that the art was little practised by native artists. Among other public-spirited undertakings, Hadrian completed the temple of the Olympian Jupiter at Athens. [ATHENS.]

The numerous specimens of sculpture of the time of Hadrian that are preserved in modern collections are evidence of the high state of the art. There are two statues of Antinous in the museum of the Capitol, one treated in the Greek style, entirely naked, and the other with Egyptian attributes, which are particularly worthy of notice for the simplicity and beauty united with grandeur that pervades them. They carry us back to the very finest period of the practice of the art.

Sculpture declined after the death of Hadrian. The difference observable, both in style and execution, in the two columns of Trajan and Antoninus, exhibit a marked change in the condition of art, even in the short period that elapsed between the execution of these works. By the time of Septimius Severus (about A.D. 200) the arts of design had rapidly declined. The sculpture on the arch of Septimius Severus, in the Forum of Rome, as well as that called the Arch of the Goldsmiths also at Rome, offer undeniable evidence of the low condition of taste, and the inferiority of practice in art. Alexander Severus endeavoured to revive a taste for architecture, and even instituted schools for the education of students; but the calamities which disturbed Italy during the contentions for the Empire left men little leisure for elegant pursuits. The dismemberment of the Roman Empire by the establishment of a seat of imperial government at Constantinople was a fatal blow to the grandeur and magnificence of Rome. Constantine endeavoured to restore a taste for architecture and sculpture; and several considerable buildings were

erected during his reign; but these buildings were mostly decorated with ancient sculptures, which he caused to be procured from all parts. Attempts indeed were made to encourage sculpture by giving employment to contemporary artists; and statues in metal were erected in this reign, and in the succeeding reigns of Constantius, Theodosius, and Honorius; but the spirit of ancient art was lost, and these works had so little merit that the names of their authors have not been recorded.

The state of Italy in the fifth and sixth centuries rendered the restoration of the fine arts utterly hopeless. The barbarians demolished the finest productions of the greatest masters of sculpture; and so sweeping had been the destruction that when Arcadius and Honorius issued fresh edicts for carrying on the work of demolition, it was questioned whether there were any statues left in the temples.

The greatest treasures of art had been preserved at Constantinople, but these were destined for no better fate. The pillage of the city by the Latins and their allies in the 12th century completed the work of destruction. The finest works were broken, or melted down to be sold for the value of their metal. The real history of ancient sculpture may indeed be said to have ended even before this period.

Revival of Sculpture.—It has been usual to date the revival of art in Italy at about the 10th or 11th century. The beginning of modern art may however be reckoned from an earlier time; rather, as Flaxman says, from the reign of Constantine, seven centuries earlier, when Christianity became the religion of the Empire. Painting and sculpture then ceased to be employed, as heretofore, on the pagan gods, but were engaged to illustrate subjects connected with Christian worship. Even during the reigns of those emperors by whom the Christians were most persecuted, they ornamented their subterraneous retreats with sacred portraits and subjects from Scripture. (Flaxman's 'Lectures on Sculpture.')

Without underrating the excellence of fine ancient models, it seems only just to assert a claim for the distinct and original character which divides modern Christian art from that of the Greek schools. After the first period of the rude attempts at design (usually in single figures, gaunt and staring images of the apostles and saints), the revivers of art seem to have aimed at appealing to the sympathies, rather than gratifying the eye and pleasing the fancy only, by presenting to them beautiful forms.

Passing over the performances of the artists who were employed in different parts of Italy in the century before his appearance, Niccolo Pisano may be considered the father of modern sculpture. [Niccolo di Pisa.] Many of the artists alluded to united, as was usual in those days, the three professions of painting, sculpture, and architecture, and their works are interesting monuments of their ingenuity; but sculpture only assumed a distinct and appropriate character when the two Pisani, Niccolo and his son Giovanni, devoted themselves to it, and by their talents diffused a love of art throughout Italy.

Andrea Orcagna, contemporary with Andrea Pisano, was an architect, painter, sculptor, and poet. His works in sculpture, notwithstanding a certain dry quality of execution that pervades them, have great merit. His most esteemed performances are the sculptures on the altar in the chapel or oratory of Or San Michele in Florence.

The works of Luca della Robbia abound in Italy. Besides his merit as an artist, he was the supposed inventor of a means of covering terra cotta models with a beautiful and peculiar varnish, which rendered them as hard as stone. In the gallery of sculpture at Florence are preserved some extremely interesting specimens of art of this period, by Benedetto da Rovezzano and others. The next distinguished names which occur in the annals of restored sculpture are those of Lorenzo Ghiberti [Ghiberti], and Donato di Betto Bardi [Donatello]. Brunelleschi was a contemporary of Donatello. [Brunelleschi].

Italy was at this time filled with artists, many of them of distinguished merit, who found ample employment in what may be called church sculpture, and occasionally in executing statues of illustrious persons. Florence perhaps boasted the highest names in the several arts, but Bologna, Padua, Milan, Naples, Siena, Venice, Modena, and even the smaller cities of Italy, all had their schools of artists.

It is a reproach to the artists of the 14th and 15th centuries, that, not satisfied with carrying out their own original ideas, and endeavouring to advance the practice of art within the limits of consistent design, they suddenly had recourse to the incongruous mixture of ancient mythology with the existing religion, an unfortunate innovation which tended to check the steady progress of sculpture by engrafting a totally foreign class of design or ideas upon their own original sentiment. They only misused or abused the one, and at the same time materially injured the effect of the other.

One of the most distinguished names of this period is that of Michel Angelo Buonarroti. [Angelo, Michel.] Jacopo Tatti, better known as Sansovino, is more deserving of celebrity as an architect than as a sculptor. [Sansovino.] Many of his scholars became distinguished artists. About this time a profusion of ornament began to be associated with works in sculpture, and led artists to neglect the simpler qualities of design for high finish and minutiæ. Among the ornamented works of the *Cinque Cento* style which are most worthy of notice, are the splendid altar candelabra in some of the Italian churches. Among the most distinguished sculptors of this period were Baccio Bandinelli and Benvenuto Cellini. [Bandanelli; Cellini.]

A list of sculptors of this school, or rather of this division of time (for each effected changes that tended to interrupt the existence or continuance of schools), must close with Guglielmo della Porta, the most skilful of all the artists of Lombardy. This artist effected some changes in the process of casting in bronze.

At the end of the 16th and the beginning of the 17th centuries, the sculptors aimed chiefly

at fine and curious execution. The works of that time exhibit very high merit in many respects, but they are deficient in repose and simplicity. The works of Giovanni da Bologna offer illustrations of this meretricious taste in sculpture, though many of his works are of the highest excellence. [Bologna, Giovanni da.] The works of the contemporary and immediately succeeding sculptors do no more than prove the rapid consummation of the fall of sculpture. [Bernini; Algardi.]

In the general survey of the rise, progress, and decline of sculpture in modern Italy, may be seen very nearly the history and condition of the art in other European countries. The artists of Italy spread themselves over the continent, and wherever works of design were required, they were probably called on to execute them. In France the first sculptor who was really distinguished was Goujon, who executed various important works in the 16th century. Among the most distinguished sculptors of succeeding times may be mentioned Pilon, Anguier, Puget, Girardon, Le Poutre, Le Moine, and Couston; but sculpture soon became decorative in France, and flutter in composition and design, and minuteness in execution, characterised their art almost from the 16th century to a very recent period. In Spain the earliest sculptors seem to have been Aparicio and Rodolfo, who lived about 1033. The next is Jayme or Jacques Castyls, of Barcelona, who is said to have executed various statues in the façade of a church at Taragona, in 1376. The name of Anrique occurs in 1380, and of F. Gonzalez in 1399. It seems however that no great progress was made in the arts in this country till the 16th century, when Spanish artists went to Italy to study, or Italian artists established themselves in Spain. In Germany the history of sculpture would lead to a wild field of inquiry; but the general progress of the art can be sufficiently traced through the Italian schools. Läffler, or Löffler, is said to have executed the bronze statues which stand round the tomb of the Emperor Maximilian at Inspruck; he died in 1565. Others attribute them to two brothers of the name of Godi.

The English learned something of the art from the Romans, and after their departure practised some branches of sculpture. Speed (quoted by Flaxman) says that 'King Cadwallo, being buried in St. Martin's church, near Ludgate, his image, great and terrible, triumphantly riding on horseback, artificially cast in brass, was placed on the western gate of the city,' &c. The workmanship of this 'great and terrible statue' was doubtless very rude and barbarous, but it is interesting to find the tradition of a work of art cast in brass in this country at so early a date. The death of Cadwallo is placed at A.D 677.

During the Saxon times sculpture was scarcely practised at all; in that of the Normans sepulchral ornaments and effigies came into use. Specimens of these may be seen in Westminster Abbey and other places.

When the Crusaders returned from the Holy Land, they endeavoured to introduce into England a taste for the magnificence they had witnessed in foreign countries, and imitations were attempted of the rich foliage and other decorations employed in their architecture. The earliest specimens in England of figures in armour are probably of the time of Richard I. Those in the Temple church, of Magnaville or Mandeville, Earl of Essex, and of two other knights similarly habited, are probably of this date.

The first example that occurs in England of a monumental figure in royal costume is that of King John, on his tomb in Worcester cathedral. Wells cathedral was built by Bishop Joceline, who died in 1242. The west front of this church is richly studded with sculpture, consisting of representations, in relief, of Scripture subjects, and of statues, many of them of colossal dimensions, of kings, queens, saints, bishops, and other patrons or dignitaries of the church. This work must have been in progress at the time that Niccolo Pisano, the restorer of sculpture in Italy, was exercising his art in his own country. Flaxman ('Lectures on Sculpture') thinks that the greater part of the sculpture was by English artists.

For some years after this period the sculpture was probably by Italian artists, scholars or imitators of Niccolo Pisano. Under Edward III. our own countrymen seem to have been capable of executing some branches of the arts of design. Many specimens of that date remain to prove both the merits of the artists and the extent to which they were employed. ('History of Westminster Palace,' by Smith; Flaxman, &c.)

The chapel of Henry VII. in Westminster Abbey is one of the most beautiful specimens of rich architectural decoration that exists in this or perhaps any country. The statues within and around it were originally very numerous. An Italian artist, Torrigiano, assisted in the construction of this magnificent chapel; but there is strong reason to believe that he was employed on the tomb only, and that the greater portion of the sculptures in other parts of the chapel were executed before he arrived in the country, it is presumed by native artists.

From the reign of Henry VIII. to Charles I. sculpture fell into neglect. Indeed it frequently happened that, during the religious animosities and the party violence that prevailed, works of art, and more especially works of sculpture, were purposely destroyed. Charles I. showed a strong disposition to encourage the arts. The celebrated Cartoons of Raphael were purchased by order of the king, and, with other fine works, were brought to this country. In this reign we meet with the names of English sculptors. Christmas executed a monument to Sir William Pitt and his lady, at Strathfieldsay in Hampshire; and Stone is the artist of a monument in Westminster Abbey, in memory of Sir George Holles, which is not without merit. Generally speaking however the style and composition of the works of this period are utterly worthless. After this time the principal works in England were by foreigners; and the names that most frequently occur are those of Cibber, Steevens, De Vere,

Bertocini, Hubert le Sœur, Scheemaker, and Roubiliac. The works of Roubiliac, with all their defects, have merits which redeem them from the condemnation to which the works of the others are generally liable. [ROUBILIAC.]

Early in the present century the first step was taken towards forming in England a national collection of ancient works of art, by the purchase of the Townley Marbles for the British Museum. Since that period the Elgin and Phigalian collections, various fine bronzes, and other specimens of ancient sculpture, have been added. The honour of giving a new direction to taste, or rather of leading it back to a recognition of true principles, is eminently due to Flaxman and Canova. Many other artists have since distinguished themselves, some of whom are still living.

Mechanical Process of Sculpture.—The technical or mechanical processes of sculpture are for the most part extremely simple. The sculptor usually begins by making a slight sketch of his subject, either drawing it on paper or at once modelling it, in small, in clay, or wax. He next proceeds to build up his statue of the desired size. The first thing necessary is to construct a sort of nucleus, or skeleton, by which the clay may be supported. This is made of wood or iron, according to the strength required, and the limbs are usually made moveable by attaching the skeleton parts to the main support, or trunk, by wire joints. The figure is then built up in clay; and whether it is ultimately to be draped or not, it should always be modelled naked, in order that the true forms may be easily distinguished, and the drapery made to fall naturally. In modelling in relief, a plane, or ground as it is called, is prepared, upon which the sculptor carefully draws his design. The clay is then laid and pressed upon this, the outline of the figures being bounded by the lines of the drawing. When the work is completed it is cast in plaster of paris, by means of a mould taken in that material.

In copying a model in marble, the first step is to prepare two stones of the same size, or at least with an exactly corresponding graduated scale marked on the front of each, on which the block of marble and the model are respectively to be placed. The fronts of the two scales are so constructed or fitted up, that a 'pointing instrument' can be applied to them. This instrument is usually composed of a pole or standard, to which a long brass or steel needle, capable of being extended and withdrawn, loosened or fixed, and moved in every direction by means of ball-and-socket joints, is attached. This is made to touch a particular part of the model. The whole instrument is then removed to the scale-stone on which the rough block is placed, and the marble is cut away till the needle reaches as far into the block as it had been fixed at upon the model. A pencil mark is then made upon the two corresponding parts of the model and block, and thus what is technically called 'a point' is taken. This process is repeated till the numerous points at fixed depths, corresponding throughout with the surface of the model, are attained, and a rough copy of the sculptor's original work is thus mechanically made. The practice of different sculptors has suggested various changes in detail; but the principle seems to be exactly similar in all. The statue being rudely blocked out or pointed, the marble is in this state put into the hands of a superior workman called a carver, who copies the minuter portions of the work, by means of chisels of various sizes, rasps, and files; the pencil marks or points showing him the limits beyond which he is not to penetrate into the marble. When the carver has carried the work as far as the sculptor desires, he proceeds himself to give it the finishing strokes, by retouching and improving the details of form and expression, by producing varieties of texture and surface and by giving that general quality or appearance to the whole which constitutes what is termed harmony of effect.

SCURF is a material composed of minute portions of the dry external scales of the cuticle. Sometimes they separate in unnatural quantities, and this constitutes the disease called Pityriasis.

SCURVY. This word, as well as its Latin synonym *scorbutus*, has been used very vaguely, both by medical men and by the public at large, to designate various diseases of the skin, often differing essentially from each other. Its derivatives, *scorbutic* and *antiscorbutic*, of which the former is employed to designate a supposed virus, the source of these diseases, and the latter the remedies employed for their cure, have been misapplied in a similar manner.

Scurvy, properly so called, is a malady of a peculiar nature, which occurs either at sea or on land as the result of various moral and physical causes of disease, especially of deficient nutriment and a scarcity or total deprivation of succulent vegetables or fruits.

Though frequent upon land, it is at sea that the ravages of scurvy have been most severely felt, and any one at all familiar with the accounts of our early navigators must remember many heart-rending tales of suffering which they record. Even as recently as the time of Lord Anson, scurvy was so fatal that during the first two years of his voyage he lost more than four-fifths of his original crew. The sagacity of Captain Cook however, only thirty years afterwards, suggested to him such means for the preservation of the health of his ship's company, that in a voyage of more than three years only one sailor of the Resolution died. The improvements which, at the suggestion principally of the late Sir G. Blane, were introduced into the victualling of the navy at the end of the last century, and especially the free employment of lemon-juice, have banished this disease from our navy, though it is still by no means infrequent in the merchant service.

For the causes and treatment of scurvy, see ANTISCORBUTICS.

SCURVY-GRASS. [COCHLEARIA.]

SCUTAGE. [ESCUAGE.]

SCUTARI, or SKUTARI. [CONSTANTINOPLE.]

SCU'TARI (*Skodré*, in Albanian, and *Iskanderé*, in Turkish), a considerable town of Northern Albania, and the capital of a pachalic which is considered one of the most important in European Turkey, is situated at the southern extremity of

the Lake Zenta or of Lake Scutari, where the Boyana issues from it, and about 18 miles from the coast of the Adriatic. It is a fortified town, and has two castles. The population of Scutari is reckoned at about 16,000, more than one-half of whom are Christians, chiefly of the Greek church, and they have a bishop. There is also a Roman Catholic bishop for those of that communion. Scutari has manufactures of arms and of woollens. The fishery on the lake constitutes another branch of industry. The lake is about 16 miles in length N.W. to S.E., and from 3 to 5 miles in breadth, and it contains several small islands. The lake lies in the high land of Albania; it is surrounded by offsets of the chain of the Scardus, and borders, on the north, on the territory of Montenegro.

SCUTELLA'RIA, a genus of plants belonging to the natural order *Labiatæ*. *S. galericulata*, Skullcap, was once considered efficacious in certain fevers. It is plentiful in Europe, Asia, and North America, in humid places, and in Britain. *S. minor*, Smaller Skullcap, is a native of Europe and Siberia, in damp places, and of Great Britain. *S. lateriflora*, is native of North America, on the margins of ponds. Most of the species of *Scutellaria* are very pretty ornamental plants, and will grow in any common soil.

SCYLAX of Caryanda, in Caria, was the author of a 'Periplus of the Parts beyond the Columns of Hercules,' of the 'History of Heraclides, king of the Mylasseis,' of a 'Periodos of the Earth,' and an 'Answer (ἀντιγραφὴ) to the History of Polybius.' (Suid., Σκύλαξ.) If all these works are rightly assigned to the same person, Scylax was not earlier than the age of Polybius; but there may have been two writers of the name.

Herodotus (iv. 44) says that Darius, the son of Hystaspes, wishing to know where the Indus entered the sea, sent various persons, and among them Scylax of Caryanda, to make the discovery. They set out from the city Caspatyrus and the territory Pactuica, and sailed down the river to the east and the rising of the sun. On reaching the sea they sailed westward, and in the thirtieth month arrived at the place whence the Phœnicians had set out who were sent by the king of Egypt to circumnavigate Libya. To this Scylax some attribute the extant Greek work entitled the 'Periplus of the Inhabited World,' which contains valuable information on the settlements of the Carthaginians, on the towns and colonies of the Greeks, and other matters. Consequently Scylax must have lived about 500 B.C. Other critics assign the authorship of the extant Periplus to the middle of the fourth century B.C. Dodwell considers the author of this 'Periplus' to be a contemporary of Polybius, and consequently he would belong to the second century B.C. The 'Periplus' is in the first volume of the 'Geographi Græci Minores' of Hudson (and in the first volume of the same work, edited by Gail, Paris, 1826, 8vo.), which contains the Dissertation of Dodwell. This dissertation, and that of Sainte-Croix, in the 42nd vol. of the 'Recueil de l'Académie des Inscriptions,' appear to exhaust the subject of Scylax the geographer.

SCYLLA'RIANS, a tribe of *Macrurous Decapods*, established by M. Milne Edwards on the genus *Scyllarus* of Fabricius, and forming one of the most remarkable groups, distinguished at the first glance by the singular conformation of the external antennæ.

M. Milne Edwards divides the tribe into three genera, *Scyllarus*, *Thenus*, and *Ibacus*.

SCYMNUS of Chios, who was alive about 80 B.C., wrote a description of the earth (περιήγησις) in Greek iambic verse, which he dedicated to Nicomédes, king of Bithynia, probably the third of the name. The first 741 verses are extant, and fragments of 236 other verses. His description begins at Gades, and follows the left coast of the Mediterranean as far as the entrance of the Pontus Euxinus, where the last verse ends. The extant verses are printed in the second volume of Hudson's 'Geographi Græci Minores,' and in the edition of that work by J. F. Gail, 1828, 8vo.

SCY'THIA, SCY'THIANS. The name of Scythians is sometimes applied by the ancient writers to all the nomade nations in the north of Europe and Asia. But the term Scythia was originally given to a part of Europe. There is some difficulty in determining the boundaries of the Scythia of Herodotus (iv. 101); but it may be said in general terms to have comprised the south-eastern part of Europe, between the Carpathian Mountains and the Tánais or Don. Herodotus ascribes to these Scythians an Asiatic origin. The date of their migration into Europe is determined, if the irruption of the Cimmerians into Lydia in the reign of Ardys (about B.C. 640) was the immediate consequence of their defeat by the Scythians. (Herod., i. 15.)

The only two important events in the history of Scythia mentioned by Herodotus are, 1st, the invasion of Media by the Scythians in the reign of Cyaxares (B.C. 635-595), and their conquest of Asia as far as the confines of Egypt, which they held for 28 years; and, 2ndly, the invasion of Scythia by Darius, the son of Hystaspes, in which the Persians were unsuccessful. In the time of Pliny, the Scythians had become extinct as a people: their place was occupied by the Germans and Sarmatians, and the Scythian name was confined to the remote unknown tribes of the north. The name of Scythia began to be applied to the northern parts of Asia in the Macedonian period.

SEA, a term used in opposition to *land*, to designate the whole volume of water which occupies the lower portion of the surface of the earth, and incloses on all sides the continents and islands on the globe. About three-fourths of the entire surface of the globe are sea.

Sea-water has a salt and somewhat bitter taste, and in its natural state is unfit for drinking or for culinary purposes. Its specific gravity is about 1.0277, rain-water being 1.0000. The water of closed seas into which many rivers fall is lighter, as that of the Baltic, which is only 1.0067. In those parts of the ocean which approach the poles the water is of less specific gravity than in those parts which lie towards the equator—a circumstance which may be due to the melting of the enormous masses of ice that are found in the higher

latitudes. The water of the Baltic contains only 1.18 per cent. of salt, but that of the Mediterranean contains 4.18 per cent.; the former being considerably below and the latter somewhat above the average of the oceanic water.

The sea at a great distance from the land has an exceedingly fine ultramarine tint, which cannot be considered due to reflection from the atmosphere, as the colour of the sea is frequently of a deeper hue than that of the sky, and does not change even when the sky is covered with clouds. This colour undergoes some changes in shoals, where it is modified by the colour of the matter which forms the bottom. The greatest variety in the colour of the sea seems to occur in the Greenland sea between 74° and 80° N. lat., where it varies from ultramarine to olive green, and from the most perfect transparence to deep opacity. The green colour is liable to changes in its position, but still it is always renewed near certain situations from year to year, frequently constituting long bands of various dimensions, and sometimes extending two or three degrees of latitude in length, and from a few miles to ten or fifteen leagues in breadth. This occurs very generally about the meridian of London, and the whales chiefly feed in this green-coloured water. When examined by Scoresby, it was found to contain a great number of medusæ, with other substances resembling small portions of fine hair.

Sea-water is much more transparent than river-water. Light penetrates it to about the depth of 60 feet. This transparency increases with the distance from the shores, and is generally greater in the higher than in the lower latitudes. But there are many remarkable exceptions to the last-mentioned fact. Some parts of the sea between the tropics are distinguished by the transparency of their waters, especially the Caribbean Sea, where zoophites and sea-plants, though growing on a bottom 30 feet deep, appear to be near enough to the surface to be plucked by a person in a boat. In the northern seas it is asserted that the bottom may be seen at the depth of from 400 to 500 feet.

One of the most remarkable properties of sea-water is a certain luminous appearance, which has been observed at night in all seas, but appears in its greatest splendour between the tropics. In calm weather, when the water is moved by the motion of a vessel, the light assumes the form of brilliant stars, or round masses of a greenish hue, frequently 18 inches in diameter. They float by the vessel in every part of the water which her bottom has touched, as deep as the lowest part of her keel, and form behind her a long and fiery train. At other times, when the breeze is strong, and the billows break and foam, the light appears like fields of flashing fire, through which the vessel is making her way. Buffon and others have supposed that this phenomenon is the result of electricity excited by friction; but the more probable and common opinion is, that it is chiefly owing to the presence of several kinds of animated beings, which have the power of emitting a phosphorescent light.

From the laws of gravitation it is inferred that the surface of the sea is always at the same distance from the centre of the earth, and that consequently it forms a uniformly regular curve. But though this inference is theoretically and generally true, careful observation has shown that parts of the sea are more or less elevated than others. This is particularly the case with closed seas. The level of closed seas is higher than that of the ocean when the mass of water brought into them by rivers is greater than that which is lost by evaporation, and the straits by which they are united to the ocean are not wide enough to carry off the surplus waters quickly. In conformity with this principle it is found that out of the Baltic and the Black Sea, both of which receive immense volumes of water from the numerous large rivers that enter them, there are steady currents through the straits that connect these seas respectively with the German Ocean and the Propontis. On the other hand, when the evaporation is greater than the supply of water from rivers, the level of the closed sea sinks below that of the ocean, and consequently there is a rush of water from the latter through the strait which unites them. This is clearly exemplified by the Mediterranean, which has a lower surface than the seas with which it is connected, in consequence of receiving a very scanty supply of water by rivers (for, with the exception of the Nile, no large stream falls into it), and in consequence of losing by evaporations, as shown by Dr. Halley, nearly three times as much water as is brought into it by the rivers: the result is that the deficiency is supplied in two ways: by the current of the Dardanelles, which brings to it the surplus waters of the Black Sea and of the Sea of Marmara; and by the current which sets through the Strait of Gibraltar from the Atlantic Ocean.

The Red Sea receives no stream of any importance, and it must lose a considerable volume of water by evaporation, which loss is supplied by the current into it from the Indian Ocean through the strait of Bal-el-Mandeb. But from May to October north winds prevail all over this sea, which cause a continual current for this interval through the strait into the Indian Ocean, leaving about two feet less water on the reefs in the northern part of the Red Sea. Now the French, who during their occupation of Egypt executed an extensive system of levelling across the Isthmus of Suez, found the surface of the Red Sea to be 32 feet higher than that of the Mediterranean. It would therefore appear that the Indian Ocean itself must be about 30 feet higher than the Mediterranean, and probably also higher than the Atlantic near the Strait of Gibraltar; and other observations have led to the conclusion that the difference of level in the different parts of the ocean is much greater than is commonly supposed. According to Lloyd ('Philos. Transactions,' 1830), who made his observations at Chagres and Panama, it appears that the water at high-water mark in the Atlantic is 13.55 feet lower than in the Pacific, and that the mean level of the Pacific is 3.52 feet higher than that of the Caribbean Sea. But the level of the Caribbean Sea is higher than that of the Atlantic

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near the Old Continent. The north-eastern trade-winds force a great volume of water from the North Atlantic into the Caribbean Sea, and this is greatly increased by the Guiana current, which enters the same sea by the strait between the islands of Martinique and Trinidad. Such volumes of water, being arrested by the long isthmus which separates the Caribbean Sea and the Gulf of Mexico from the Pacific, must produce a considerable accumulation of water along the western shores of those seas, and raise them considerably above the common level of the Atlantic, and this inference is confirmed, both by observation and by the rapid current called the Gulf Stream. [Atlantic Ocean.]

The bottom of the sea is similar to the surface of the land as to the irregular succession of elevations and depressions, and it is diversified by mountains and valleys and plains of different elevation. The summits of the sub-marine mountains rise above the level of the sea in the form of islands. In several parts large table-lands are found, the surface of which is at no great depth below the level of the sea. Near their edges the depth of the sea is generally very great. The most extensive formation of these submarine table-lands occurs in the great series of banks that lie at no great distance from the east coast of the United States, and with little intermission extend from Newfoundland and the Gulf of St. Lawrence to the most southern extremity of the peninsula of Florida, to the westward of which, in the Gulf of Mexico, lies the Tortuga bank, which skirts the shores of the United States as far west as the mouths of the Mississippi. This series of banks is more than 1400 miles in length; but there is always water enough on them for the largest vessels, with the exception of the Virgin Rocks on the Great Bank of Newfoundland, and the shoals of St. George's Bank. These banks, especially those north of 40° N. lat., are frequented by immense shoals of cod and other fish.

South-eastward from the banks along the east coast of Florida, and separated from them by the Gulf stream, are the Columbian banks, which extend to the Mona Passage between Haïti and Puerto Rico, and consist of the Little and Great Bahama Banks, which occupy the north-western portion of the group, and of five smaller banks occurring at great distances from one another in a south-eastern direction. These banks have from 15 to 20 fathoms water on their edges, but they are beset with rocks and shoals, of which a few are dry at low water: they are therefore shunned by vessels. The surface of the banks consists of coral, covered with an accumulation of shells and calcareous sand. On their eastern edges, along the Atlantic, are the Bahama Islands.

Among the smaller banks which occur in the Atlantic, are the Bank of Arguin, which lies near the western coast of North Africa, beginning at Cape Blanco, and extending to the neighbourhood of Portendik; and the Abrolhos, near the coast of Brazil, between 16° and 18° S. lat.: both of these are extremely dangerous to navigators, but are much resorted to for the fish in which hey abound.

There are several banks in the Indian Ocean: the most extensive are those of Saya de Malha and Nazareth, the former extending between 8° 18′ and 11° 30′, and cut by 61° 30′ E. long., the latter stretching from the Cargados Islands, in 16° 47′ S. lat., 60° E. long., to 14° S. lat.

The Agulhas Bank, which skirts the southern extremity of Africa, from the Cape of Good Hope to Cape Padrone, E. of Algoa Bay, is not divided, like the other banks, from the continent by a tract of deeper water; it is therefore not to be considered as a table-land, but as a submarine prolongation of the continent. Between Cape Agulhas and Cape Vaccas, it extends above 150 miles from the continent. The depth of water on this bank varies between 30 and 90 fathoms. The surface is composed of coarse sand, corals, shells, and small stones. Along its western edge it is skirted by a mud-bank, which is covered by water from 50 to 120 fathoms deep.

There are numerous banks in the Pacific, especially south of 20° N. lat. All the larger banks are surrounded by coral reefs, on which islands of small extent often occur.

Near banks, the sea usually deepens to 200 and 300 fathoms, and even more; but in general we are very little acquainted with the depth of the deeper parts of the sea. We are better acquainted with the depth of several close seas. The depth of the Baltic varies between 30 and 40 fathoms, and only in two or three places sinks below 100 fathoms. The North Sea is somewhat deeper in its northern part. Between the Shetland Islands and the coast of Norway the depth varies between 80 and 140 fathoms, but it gets gradually shallower towards the south. In the Straits of Dover, the deepest place is only 26 fathoms. The depth of the English Channel increases as we proceed towards the west, but very slowly. East of the Eddystone it does not exceed 50 fathoms. The Irish Channel has a depth of between 60 and 80 fathoms. The Mediterranean is much deeper than the Baltic and North Sea, more especially along the southern coast of Spain and about the Island of Sardinia, where the depth varies between 500 and 1000 fathoms. A shallow tract extends from Trapani in Sicily to Cape Bon in Tunis: it is called by the Italian sailors *scherchi*, and is of inconsiderable but very variable depth. That portion of the Mediterranean which lies E. of this tract is not so deep as the western part. The sea which surrounds the islands of the Indian Archipelago seems nowhere to sink much below 50 fathoms.

In most parts of the Atlantic, where the sea has been sounded, no bottom was found with 300 fathoms. It seems however that between Europe and America it is not so deep; but in these parts the bottom seems to offer great inequalities, being furrowed by deeper tracts, which run north and south. Phipps and Scoresby sounded in several places between Spitsbergen and Greenland with from 780 to 1200 fathoms, without finding a bottom; and Ellis and Ross did the same in Hudson's Bay and Baffin's Bay. In the Pacific Ocean the depth seems also to be very great, but few soundings have been made there.

The depth of the sea near the land varies with the nature of the shores. Where the country near the sea is elevated, and terminates in high and rocky shores, the sea is generally of considerable depth. Such shores have generally good and safe harbours. But when a low plain terminates on the sea with a flat sandy bank, the sea is shallow and frequently continues to be so to a great distance from the shore. These low shores are generally destitute of harbours.

It is a well-established fact that places near the sea have a more uniform climate than those which are at great distances from it, though in the same latitude. Inland places experience a much greater degree both of heat and cold than places on the coast, and the difference between these degrees of heat and of cold increases with the distance of the place from the sea. The explanation of this phenomenon is pretty clear, since it has been proved by observation that the temperature of the air over the sea is less subject to changes than, or rather does not undergo such great changes, as that of the air which is over the land.

Winds must of course affect the temperature of both elements. It appears to be established, by the observations of Péron, that the temperature of the water is always diminished during a gale, but at a much slower rate than that of the air. Weddell, in 53° S. lat., experienced a chilling south wind, by which the temperature of the air was reduced to 39.30°, whilst that of the sea was 49.30°.

It is a very remarkable phenomenon, which has not yet been satisfactorily explained, that the temperature of the sea generally decreases as the land is approached, and it also decreases on shoals and banks; and as this decrease may be detected by the thermometer at a considerable distance from land, this instrument is used for the purpose of ascertaining the approach to land or the presence of shoals. With regard to the temperature of the sea from the surface to the bottom at any point, it has been found that the law which is constant for the earth must be inverted for the sea. The farther we descend into the interior of the earth, the higher is the temperature; but the deeper we dip into the sea, the lower is the temperature of the water. Almost all the observations which have been made tend to show that the temperature near the surface decreases very slowly, and more rapidly at a certain distance from it; but at a great depth it again decreases at a slower rate, and afterwards it becomes stationary. But to this law (if it really deserve that name) there are many exceptions; and the instances are not few in which a new increase of the temperature has been observed at a very great depth. Horner, in Krusenstern's 'Travels,' observes that in some places in the Gulf-stream the hand-lead, when it had descended to a depth of between 480 and 600 feet, was heated to such a degree that it was impossible to take it into one's hand. Scoresby found that the sea between Greenland and Spitzbergen at a depth of from 100 to 200 fathoms was from 6° to 7° warmer than at the surface; and Franklin states that when he accompanied Captain Buchan in his expedition to the North Pole, the water brought from any great depth was invariably found to be warmer than that of the surface. The explanations given of this increase of temperature at a great depth are mere suppositions and conjectures; nothing certain is known on the subject.

Masses of ice surround the two poles. It is probable that in the vicinity of the poles the ice constitutes one continuous and unbroken mass. But from Parry's voyages it seems clear that encircling this great mass there are immense moving fields of ice which lie close together, and are only occasionally divided from one another by narrow straits. The pieces of ice which detach themselves from this great accumulation and enter the open sea are called *heavy drift-ice*. The larger pieces of ice of this description are sometimes a mile in length and breadth, and thirty feet thick. The term *ice-field* is applied to sheets of ice so extensive that their limits cannot be discerned from the mast-head. They often occur of the diameter of twenty or thirty miles, and, when they are very closely united, they sometimes extend to the length of fifty or a hundred miles. Their average thickness may be from ten to fifteen feet, and their surface is mostly level, except where *hummocks* or low ice-hills occur at the junction of the fields, and then the thickness is often forty and even fifty feet. The smaller fields, the extent of which can be seen from the mast-head, are called *floes*. The surface of these masses of ice, before July, is always covered with a bed of snow from a foot to a fathom in depth; this snow dissolves in the end of summer, and forms extensive pools and lakes of fresh water. It is supposed that they are generated in the sea which lies between Greenland and Spitzbergen, and which, though navigable during the summer, is covered with a continuous sheet of ice in the colder season. The fields appear to be the parts of this great sheet, formed by its breaking up at the approach of summer. *Icebergs* are immense pieces of ice, some of which attain a height of 100 feet above the surface of the sea, and a few have been found which seemed to be more than twice that height. Their base near the surface of the sea is not extensive, the larger masses generally being not more than 4000 feet in circumference. The most common form of the iceberg is for one side to rise perpendicularly to the very summit, the opposite side being very low, while the intermediate surface forms a gradual slope. Some have regular flat surfaces, but frequently they present a great variety in form and appearance. Sometimes earth, gravel, and sand may be observed in them. In fact icebergs are pieces broken off from glaciers. They are rarely met with in the sea between Greenland and Spitzbergen, because in these parts only a few glaciers approach near the water's edge. But on both sides of Davis's Strait and Baffin's Bay, and also on the eastern shores of Greenland as far north as 70° N. lat., glaciers cover the land, and in many places advance to the shores of the sea. It is only in the sea which surrounds these coasts that icebergs are numerous. They seem to owe their origin to the circumstance of glaciers being in a continual state of progress. The glaciers of Greenland,

which are situated on the margin of the sea, protrude their exterior parts over the ocean, and in summer, when the ice becomes brittle, the force of cohesion is overcome by the weight of the prodigious masses that overhang the sea, and they are detached from the glacier with a dreadful crash. Thus an iceberg is formed. These icebergs, as it seems, are most common along the eastern shores of Greenland, and at the distance of 15 to 20 miles from the coast, where they occur by hundreds and thousands, forming a sort of barrier outside the drift-ice which is near the shore, and preventing its removal by an off-shore wind.

These masses of ice render navigation very dangerous; and the ice-fields especially, which from some undiscovered cause frequently have a rotatory motion, have caused the loss of many whaling vessels. Icebergs are less dangerous on account of the small space which they occupy, and of their being descried at night or in foggy weather more easily than ice-fields; whaling-vessels often find shelter under their lee from strong adverse winds, and supply themselves with fresh water from the pools formed during summer in their depressions.

On approaching a field of ice, the *ice-blink* is seen whenever the horizon is tolerably free from clouds, and sometimes even under a thick sky. It consists of a stratum of lucid whiteness, which appears over the ice in that part of the atmosphere which joins the horizon. A clear sky presents a beautiful and perfect map of the ice, 20 or 30 miles beyond the limit of direct vision, but less distant in proportion as the atmosphere is more dense and obscure.

It appears that there is scarcely any portion of the surface of the sea which is not subjected to some kind of motion, and this circumstance must tend greatly to preserve its purity. The water in some parts of the sea is always propelled in the same direction by the currents. Nearly the whole sea is four times in the day subject to a change in its level by the movements of the tides. The motion produced by the winds is much less regular. The wind striking the surface of the sea, in an oblique direction, pushes some of the water on the surface over that which is contiguous to it, and thus raises it above the common level, until so much water is accumulated that the wind is unable to maintain it in that position, and it falls down. Each wave presents a gently-ascending surface to the windward, and a perpendicular descent leeward. The elevation of the waves varies according to the strength of the wind; in very strong gales they attain an elevation of thirty feet. This motion of the surface of the sea is not perceptible to a great depth. In the strongest gales it is supposed not to extend beyond 72 feet below the surface, and at a depth of 90 feet the sea is perfectly still. When the waves run to a low shore, the slope of the ground breaks their force, and they terminate in a tranquil manner; but when they strike against an elevated rocky coast, being repelled by the rock, they produce what is called a *surf*. This violent rising of the sea on a rocky coast sometimes attains an elevation of 100 feet above the sea-level. The waves do not subside simultaneously with the wind; frequently during a calm after a gale they rise higher, and their most elevated part forms a more acute angle than during the gale. Such a state of the sea is called a *hollow sea*.

The sea, by means of the vapours continually rising from its surface, supplies the atmosphere with sufficient moisture for the support of organic life. Those parts of the earth which are farthest from the sea are much less fertile and populous than those which, owing to their greater vicinity to it, receive a larger supply of moisture from this great source. The sea contributes also considerably to the advancement of civilization, by the easy communication which it affords between nations great distances from one another.

SEA-BEAR. [Bear; Seals.]

SEA-CALF. [Seals.]

SEA-CAT. [Anarrhicas.]

SEA-DOVE. [Auk.]

SEA-DUCKS. [Fuligulinæ.]

SEA-ELEPHANT. [Seals.]

SEA-HORSE. [Seals.]

SEA-KAIL, or SEA-CALE. [Crambe Maritima.]

SEA-LION. [Seals.]

SEA-MOUSE. Cuvier remarks that the *Aphrodita* of Linnæus is easily recognised among the *Dorsibranchiate Annelids* by the two longitudinal rows of wide membranous scales which cover the back, and under which are hidden their branchiæ, in the form of small fleshy crests. Their body is generally flattened in form, and shorter and wider than it is in the other Annelids. Their very thick and muscular œsophagus is capable of being extruded like a proboscis. They have an unequal intestine, furnished on each side with a great number of branched cæca, the extremities of which go to fix themselves between the bundles of bristles that serve for feet.

Example.—*Halithæa aculeata, Aphrodita aculeata*, Linn., the Sea-Mouse. This is a very beautiful animal, and most superbly coloured. It is oval, six or eight inches long, and two or three wide. The scales of the back are covered and hidden by a kind of flocky down, like tow, which springs upon the sides, and from which issue groups of strong spines, that pierce, in part, the flocky covering, and bundles of flexuous bristles, glittering like gold, and changing into all the colours of the rainbow. Cuvier says, and without exaggeration, that they do not yield in beauty either to the plumage of the Humming-Birds nor to the most brilliant precious stones. Lower down is a tubercle, out of which come spines, in three groups, and of three different sizes, and finally a fleshy cone. There are forty of these tubercles on each side, and between the first two are two small fleshy tentacles. There are fifteen pairs of scales, which are wide and sometimes puffed up, on the back, and fifteen small branchial crests on each side.

SEA-NETTLE. [Ciliograda.]

SEA-PHEASANT. [Ducks.]

SEA-PIE, one of the names for the Oyster-Catcher, *Hæmatopus ostralegus*, Linn. (Order *Grallatores*, Family *Charadriadæ*.)

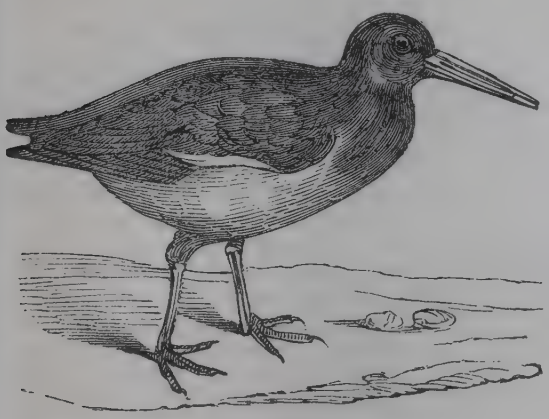
Generic Character.—Bill long, strong, compressed; point very much compressed, chisel-like.

Nostrils lateral, longitudinally slit in the groove of the bill. Feet strong, muscular; three toes directed forwards, middle toe united to the external one, up to the first joint, by a membrane, and to the internal toe by a small rudiment; toes bordered with the rudiment of a membrane. Wings moderate, the first quill longest.

Habits of the Genus.—The species live along the sea-shore, on the beach or sands; they follow the retreat of the waves, to gather such crustaceous or marine animals as they wash up. They assemble in great flocks for their migrations, but live solitarily during the time of pairing and incubation. Their nests are made in the herbage and in the marshy meadows near the sea, and they both run and fly with rapidity. Their cry is shrill and resounding. They moult twice, in autumn and spring, but the colours of the plumage scarcely change at all at those periods; the only marked difference observed, at this change of plumage, exists in the absence or presence of the white gorget. There is no difference in the sexes. (Temm.)

The common Oyster-Catcher, *Hæmatopus ostralegus*, is the only European example. It is extensively spread through the Old World. It is found in the British Islands, and throughout Asia as far as Japan, and is common in the northern latitudes. It is represented in America by a distinct species, *H. palliatus* (Temminck).

The common Oyster-Catcher is *L'Huiterier*, *Pie de Mer*, and *Becasse de Mer* of the French; *Beccaccia di Mare* of the Italians; *Aeusternfischer* of the Germans; *Oyster-Catcher* and *Sea-Pie* of the British.



Sea-Pie (*Hæmatopus ostralegus*).

Food, Habits, &c.—Small crustaceans, &c., and bivalve mollusks, which last its powerful bill and frame well enable it to open, so as to get at the contents. It will frequently wade far out, and trust to swimming back for its return. Their four eggs, of a bright hue, inclining to olive or yellowish stone colour, spotted with ash-gray, or dark brown, or blackish, are deposited in a shallow hole, scratched in the gravel or sand, and sometimes among the shingles of the beach, but most frequently among the herbage of marshy places near the sea. It can hardly be said to make a nest. Time of incubation three weeks. Young when first hatched covered with down of a brownish gray colour. It is sometimes seen far up rivers and inland, where it feeds on earth-worms, &c., and fresh-water insects and mollusks. Easily domesticated in poultry-yards.

SEA-URCHINS. [ECHINIDÆ.]

SEA-WATER. The most abundant principle in Sea-Water is common salt, which constitutes nearly two-thirds of the whole saline matter. The specific gravity of sea-water varies, according to the proportion of the saline ingredients, from about 1.026 to 1.030. The late Dr. Marcet made some interesting experiments on this subject, and the general conclusions which he drew from them are thus stated by Dr. Prout, in his 'Bridgewater Treatise:'—

1. That the Southern Ocean contains more salt than the Northern Ocean, in the ratio of 1.02919 to 1.02757.

2. That the mean specific gravity of sea-water near the equator is 1.02777, or intermediate between that of the Northern and that of the Southern hemispheres.

3. That there is no notable difference in sea-water under different meridians.

4. That there is no satisfactory evidence that the sea at great depths is more salt than at the surface.

5. That the sea in general contains more salt where it is deepest and most remote from land, and that its saltness is always diminished in the vicinity of large masses of ice.

6. That small inland seas, though communicating with the ocean, are much less salt than the ocean.

7. That the Mediterranean contains rather larger proportions of salt than the ocean.

The following are two analyses of sea-water; the first by Mr. Laurens of the water of the Mediterranean, and the second by Dr. Schweitzer of that of the English Channel near Brighton:—

	Mediterranean. grains.	Eng. Channel. grains.
Water	959.06	964.74
Chloride of Sodium	27.22	27.06
Chloride of Magnesium	6.14	3.67
Sulphate of Magnesia	7.02	2.30
Sulphate of Lime	0.15	1.40
Carbonate of Lime	0.09	0.03
Carbonate of Magnesia	0.11	traces
Carbonic Acid	0.20	
Potash	0.01	
Iodine, Extractive Matter, Bromide of Magnesium	traces	
	1000.	1000.

While the substances above described may be regarded as the usual saline constituents of sea-water, it has been shown that the waters of the western coast of Africa and other localities spontaneously evolve sulphuretted hydrogen in very considerable quantities.

The water of the Dead Sea, according to Dr. Marcet, has a specific gravity of 1.211; and by his analysis 1000 grains consist of—

	Grains.
Water	754.20
Chloride of Sodium . .	103.60
Chloride of Calcium . .	39.20
Chloride of Magnesium . .	102.46
Sulphate of Lime . . .	.54
	1000.

SEA-WEEDS are those plants which are found growing at the bottom of the sea. They form a large proportion of the numerous family *Algæ*, and are all of them cryptogamic plants. Although many of the jointed and disjointed Algæ are found in sea-water, and might be called sea-weeds, we shall confine our remarks here to those forms of the jointless Algæ which comprehend the genus *Fucus* and its allies, and contain the most striking and useful forms of these plants.

The first section of this group of water-plants is the *Fucoideæ*, which have for their type the genus *Fucus*. They are all of them marine plants, of an olive brown or greenish colour, and very fine in their texture. The cellular structure of which all the Algæ are composed is in these plants in a very condensed state, assuming a leathery and sometimes even a woody character. They are of very rapid growth, and only a few months serves to cover a surface of naked rock with a forest of various species of Fuci. Kelp is manufactured from the species of plants belonging to this section of Algæ; the one most commonly collected for this purpose is the *Fucus vesiculosus*. Kelp is not now manufactured to any great extent in this country, but a few years since it was a source of considerable wealth in the Western Islands and the western shores of Scotland.

The *Lichenecæ* are a small group of these plants, which are interesting in a botanical point of view on account of their resemblance to the Lichens, or Liverworts, thus serving to connect the Algæ, which are the Lichens of the sea, with those which grow on the land. There is only one genus *Lichena*, of which there are two species, both British, the *L. pygmæa* and the *L. confinis;* they both grow on rocks which are never permanently submerged, and thus in habit as well as in structure they approach the liverworts.

The *Laminarieæ*, or Tangles, have a densely fibro-cellular structure, and their spores are collected together in sori on the surface of the frond. These plants are coriaceous or membranaceous in structure, and are little changed by exposure to the air. Some of these are used. *Laminaria esculenta* is an edible species. It grows to the length of twenty feet, and the midrib, stripped of its membranaceous covering, is the part that is eaten. *L. saccharina*, or the Sugar Sea-Belt, is said to be eaten by the Icelanders. In Japan it is also considered a great delicacy. *L. digitata*, or Sea-Wand, is eaten in Scotland, and is cried about the streets of Edinburgh, as Tangle. Many of these sea-weeds have been found to make excellent manure for grass-lands.

The *Sporochnoideæ* is a small group composed of the Scatter-Tuft (*Sporochnus*) and three other genera, which are remarkable for bearing little tufts of fine green filaments on the fronds.

The *Dictyoleæ*, or Sea-Networks, are a larger section than the last, and are characterised by the beautifully-reticulated texture of the tegument. To this section belongs the *Chorda filum*, Sea-Whipcord, which is often found thirty or forty feet in length.

The *Floridecæ* are an extensive section, and include some curious and valuable species. The *Chondrus crispus*, or Carrageen Moss, belongs to this section. In Ireland it is used extensively as an article of food, and has of late years been sold in London as a substitute for Iceland Moss. It is frequently employed, instead of isinglass, for the manufacture of blanc-mange and jellies. It has a slightly bitter flavour, which may be removed by steeping for some time previous to boiling. A species of *Gelidium* is said to be the substance collected by the swallows and used in the construction of the edible nests of Java. Several other species of Gelidium are made use of as food, more especially in the East, where they are added to dishes to render the hot and biting condiments more palatable. The species of *Gracillaria* are also used as food, and one of them, *G. lichenoides*, is highly valued in Ceylon and other parts of the East, and bears a great resemblance to *G. compressa*, a species of the British coast, and which Dr. Greville says is little inferior to the first, and has been used in this country both as a pickle and a preserve. The *G. tenax* is invaluable to the Chinese as the basis of an excellent glue and varnish. A celebrated vermifuge on the Continent is prepared from the *Helminthocorton*, a genus which grows in the Mediterranean, and goes by the name of the Coralline of Corsica. The *Plocamium*, or Hair-Flag, is one of the most elegant plants of this section. It was formerly used much in the construction of artificial landscapes on paper, and its collection and preparation gave employment to many of the poor on our coasts.

The *Thaumasieæ* consist of the curious genus *Thaumasia*. It has been found round the coasts of Ceylon.

The *Gastrocarpeæ* are known by their ribless veinless fronds, with a cellular tissue extremely hard and tough, but internally soft and gelatinous. The *Iridea edulis*, Edible Dulse, is a favourite food with many of the crustaceæ, as lobsters, crabs, &c. It is also eaten by fishermen, both raw and roasted. It is said to resemble in flavour roasted oysters. The *Halymenia palmata* is a plant of considerable importance. The Icelanders prepare it by washing it well in fresh water, and exposing it to dry, when it gives out a white powdery substance, which is sweet and palatable, and covers the whole plant; they then pack it in casks to keep it from the air, and thus preserve it ready to be eaten, either in this state with fish and butter, or, according to the practice of wealthier tables, boiled in milk, and mixed with a little flour of rye. In Kamtchatka it is used for making a fermented beverage, which is easily produced, on account of the great quantity of sugar this plant contains.

The above sections of the family *Algæ* contain most of the Sea-Weeds; but a few more belong to *Ulvaceæ*, and are not exclusively marine plants.

SEAFO'RTHIA, a genus of palms indigenous to the eastern coast of tropical Australia, and found also in the nearest Asiatic islands. The species are elegant in appearance.

SEALS, PHO'CIDÆ, a family of Marine Carnivorous Mammiferous Quadrupeds.

The *Amphibious Carnivora* of Cuvier form a perfectly natural group. Their feet are so short and enveloped in the skin, that they are not available for any purpose on land, except a kind of creeping; and indeed terrestrial progression is effected by means of a sort of shuffling jumping motion, in which the spine and the muscles of the body are principally employed, though the extremities are used in getting or rather climbing out of the water upon a rock or other projecting body. The webbed intervals of the toes, which last are completely enveloped in membranes that leave a considerable power of expansion to the extremity, serve as excellent oars; and these amphibia therefore pass the greatest part of their life in the sea, coming on shore only to bask and sleep in the sun, and suckle their young ones. Cuvier remarks that their elongated body, their very moveable spine, provided with muscles which put it in action with powerful flexibility, their narrow pelvis, their close thick fur, all unite to make them good swimmers, and the details of their anatomy confirm the impression produced by their external form. ('Règne Animal.')

Two genera only, taking the term genus in its most comprehensive sense, belonging to this group, have as yet been discovered, the Seal (*Phoca*, Linn.), and the Walrus or Morse (*Trichechus*, Linn.).

Seals.

If the skull of the common Seal (*Phoca vitulina*) be compared with that of an *Otter*, a great resemblance will be found to exist between them in the shortness of the muzzle, the compression of the interorbital region (which is greater in the seal), the width and flatness of the cranium, and especially of the whole region of its base or under part, with the exception of the tympanic portions, which are large and convex. The orbit is very large, and the frontal bone does not complete it backwards by a postorbital apophysis, nor is it distinguished from the temporal bone, except by the convexity of the last-named portion of the skull. The temporal crests are but little marked, and the occipital crest is insensible. The frontal bone does not form in front that triangular enlargement, the traces of which are still to be found in the otter; but the postorbital apophysis of the zygomatic arch is very strongly marked, and the jugal and temporal bones equally contribute to form it. The intermaxillary bones terminate near the nasal, without reaching to them: their suture below traverses the palate opposite the canines, and even, in the middle, opposite to the first molars. The palatine bones do not pass in front of the last molar, but their posterior border is situated very far back: this posterior border of the nostrils is notched by a re-entering angle. The pterygoïd apophyses of the palatine bone run very far back, slipping over those of the sphenoïd, which are very early soldered to the body of the bone, and have a tubercle on their anterior border, at the point where they touch the edge of the posterior nostrils. The part of the palatine bone which is in the orbit is moderate, and so is the orbital wing of the sphenoïd; the temporal bone is small and narrow; the parietal bones are early soldered to the occipital. Cuvier could neither detect a lachrymal bone nor a lachrymal hole. The bones of the cranium are thin, and there are no frontal sinuses.

The skull of the Monk Seal (*Phoca Monachus*, Herm.) presents, independently of its size, some rather striking differences when compared with that of the *Phoca vitulina*. The zygomatic arches are more open and robust in the former; the anterior region of the frontal bone is convex; a very marked sagittal crest commences on the middle of the orbits and proceeds to join an occipital crest as strongly marked, which notches the back part of the cranium with a re-entering angle. There is also a notch at the posterior border of the palate, and the intermaxillary bones are very distinctly articulated to the nasal. On the anterior border of the orbit is a projecting point formed by the maxillary bone; and an obtuse longitudinal crest projects under the basilary region. In the upper jaw there are only four pointed molars, the external ones being very slightly the largest; below there are four, also smaller; altogether five molars on each side of each jaw, less trenchant, and with lateral points much less marked than in *Phoca vitulina*.

For a complete account of the comparative osteology of the Seals, see Cuvier's 'Ossemens Fossiles.'

In these *Pinnigrade Feræ* the whole form is adapted for progression in water. Instead of the lengthened anterior extremities and phalanges of the bats, framed to support a wing for their passage through the air, we have all the bones of those extremities in the seal short and compact, in order to support the finlike arm and deteriorated hand. We have the conical shape of the body and the extremely narrow pelvis, to favour that shape so as to produce the least resistance in passing through the water, with the short femur and posterior extremities directed backwards.

Cuvier remarks that what the seal loses of facility of motion on land, in consequence of the shortness of its limbs, is made up to it by the swimming power given by the mobility of the spine: all the vertebræ are distinct, very moveable upon each other, and furnished with very distant apophyses, which do not interfere with each other. There are 7 cervical, 15 dorsal, and 5 lumbar, 4 sacral and 12 caudal = 43; at least Cuvier found in all his skeletons the number given for the cervical, dorsal, and lumbar regions, and the number stated for the sacral and caudal regions in *Phoca Monachus;* and he adds that he has reason to believe that there would have been four sacral vertebræ in his other seals, if they had been adult; that he doubts whether *Otaria* has more than three; and that the tails consist generally of from ten to twelve vertebræ. The spinous processes are very much elevated in *Phoca Monachus*,

moderate and more depressed in *Otaria* and *Phoca vitulina*, and nearly effaced in *Phoca mitrata*.

The stomach in these fish-eating animals is simple, the cæcum short, the intestinal canal long. The tongue is smooth and notched at the tip, and the sense of taste is evidently well developed, as is that also of smell. The senses of hearing and of sight are also enjoyed in great perfection. With regard to hearing we may observe, that the auditory nerve is very large, and though the auricular aperture is closed by a membrane, somewhat similar to that which shuts the nostrils, in order to prevent the entrance of water, yet even while deeply immerged these animals hear distinctly, and rise to listen to the sounds of a flute, fife, or violin, enjoying the notes, and disappearing when the melody ceases.

The countenance of the seal, and the fulness of its fine eyes, would on a primâ facie glance seem to denote intelligence of no common order. In fact the seal is not only intelligent and easily domesticated, but becomes greatly attached to those who rear it and treat it kindly. Its sagacity was noticed by Pliny, who observes that it is easily taught to perform tricks, and salute persons, and answer to its name when called. M. Fred. Cuvier saw a tamed seal which performed readily many amusing feats. When desired to raise himself erect on his hind legs, and to take a staff in his flippers, like a sentinel, he obeyed the word of command; he would lie down on his right side or his left according to order, and tumble head over heels when directed to do so. He gave a paw when required, like a dog, and protruded his lips for a kiss. This animal appeared to be very fond of its master. It may be added that the brain in the seal is voluminous. The whiskers are the great organs of touch in the seal; they communicate with nerves of considerable size, and the slightest impression produces sensation.

We may now advert to the peculiarities of the circulation and respiration in these animals. Not only have they the power of closing and opening their valvular nostrils at pleasure, but the interval between their respirations is very long.

Such a provision is absolutely necessary for animals that pass so much of their life in the water and take their food there: for ordinarily the seal eats in the sea, though it can also eat upon land. The breathing is not only slow; it is also irregular. After opening the nostrils and making a strong expiration, the animal inspires a large quantity of air, and closes the nostrils. In the intervals of this infrequent respiration, it is evident, from the free motion of the ribs, and the general deportment of the animal, that the lungs receive their regular supply of air. In a state of nature a quarter of an hour, and as much as twenty-five minutes have been known to elapse between their descent from the surface and their ascent thither for the purpose of obtaining a fresh supply; and in confinement they have been observed to remain asleep with the head under water for an hour at a time, and consequently without breathing during that period. To account for this power physiologists were of opinion that the foramen ovale remained unclosed in these animals, and that thus the sanguiferous circle was not interrupted during the time of their stay under water; but Cuvier and Lawrence found it closed in the seals dissected by them, and we must look to some other conformation for the endowment of this faculty. Thus Cuvier states that there is a great venous sinus in their liver, which assists them in their divings by rendering their respiration less dependent upon the circulation; and Mr. Houston has pointed out other venous reservoirs in the neighbouring parts. These provisions seem to be quite different from the great arterial plexus first pointed out by John Hunter in the *Whales;* for in the seals the blood appears to be laid up, not in a network of vessels, but, so to speak, in wide canals. The term *veineux* is certainly used by Cuvier, and a reservoir of arterial blood would, reasoning from analogy, be required for the purpose of keeping up healthy life during submersion; but there can be little or no doubt that these reservoirs are intimately connected with the power of remaining long beneath the water, though as yet the mode of operation is not satisfactorily made out, as it is in the Whales. The last-mentioned author states that their blood is very abundant and very black.

We now proceed to give examples of some of the leading genera.

Calocephalus. Molars formed principally of one great point placed in the middle, one smaller situated below, and two, also smaller, placed posteriorly. Cranium convex on the sides, flattened on the top: slight rugosities, instead of occipital cristæ.

Incisors, $\frac{6}{4}$; Canines, $\frac{1—1}{1—1}$; Molars, $\frac{5—5}{5—5} = 34$.

Example.—*Calocephalus vitulinus.* This is the *Phoca vitulina* of Linnæus; *Le Veau Marin* and *Phoque Commun* of the French; *Vecchio Marino* of the Italians; *Lobo marino* of the Spanish; *Meerwolf* and *Meerhund* of the Germans; *Common Seal* and *Sea-Calf* of the British.

The Common Seal inhabits the northern seas generally, and the coasts of England, France, &c. It is comparatively scarce on the southern coasts of Britain now, but still haunts the æstuaries of the Tees.

The ground-colour of the hair or skin of this species, when the animal is alive and dry, is pale whitish gray with a very slight tinge of yellow; when just out of the water and wet, the ground-colour is ash; after death, and, as seen in museums, the ground-colour is pale yellowish gray, the oil having penetrated the skin, and rendered the hair of a more yellow hue. The body above is clouded and marbled with blackish gray. Space round the eyes and muzzle, sides of the body, all the lower parts and the feet, pale grayish, becoming nearly white beneath. There is some brown on the muzzle and upper part of the tail, whiskers moderate, undulated. Claws black and rather strong. Length from 3 to 5 feet.

Mr. Farrington, then of Dinas in Caernarvon-

shire, gave the following account of the habits of the *Phoca vitulina* to Pennant:—'The seals are

Common Seal (*Calocephalus vitulinus*).

natives of our coasts, and are found most frequently between Llyn in Caernarvonshire and the northern parts of Anglesey: they are seen often towards Carreg-y-Moelrhon, to the west of Bardsey, or Ynys Enlli, and the Skerries, commonly called in the British language Ynys-y-Moelrhoniad, or Seal Island. The Latin name of this amphibious animal is *Phoca;* the vulgar name is Sea-Calf, and on that account the male is called the bull, and the female the cow; but the Celtic appellative is *Moelrhon,* from the word *Moel,* bald, or without ears, and *Rhon,* a spear or lance. They are excellent swimmers and ready divers, and are very bold when in the sea, swimming carelessly enough about boats; their dens or lodgments are in hollow rocks or caverns near the sea, but out of the reach of the tide. In the summer they will come out of the water to bask or sleep in the sun, on the top or large stones or shivers of rocks, and that is the opportunity our countrymen take of shooting them. If they chance to escape, they hasten towards their proper element, flinging stones and dirt behind them as they scramble along, at the same time expressing their fears by piteous moans; but if they happen to be overtaken, they will make a vigorous defence with their feet and teeth till they are killed.'

Calocephalus Grœnlandicus, the Greenland Seal. This is the *Phoca Grœnlandica* of Muller; *Phoque à Croissant* of Buffon; and *Harp-Seal* of Pennant and others.

The hair of the Greenland Seal is drier and closer to the hide, and more free from wool than that of the other species; each hair is flat and lustrous. A large brown oblique band, irregularly dentilated, commences nearly above the shoulders, where it joins that of the other side, and is carried along upon the sides and up to the hind legs, becoming by degrees brighter there and losing itself in the white of the belly: the posterior extremity approaches that of the other side at the root of the tail. Some small brown spots are scattered about both in the gray of the back and in the pale part of the band. The bands and spots become more and more black with age.

According to Crantz, this species, when newly born, is quite white and woolly. In the first year it is cream-coloured; in the second, gray; in the third, painted with stripes; in the fourth, spotted; and in the fifth, wears its half-moons as the sign of its maturity.

Localities, the Frozen Ocean, Greenland, Newfoundland, Iceland, the White Sea, Kamtchatka. Rare in Britain.

To the Greenlander this species is all important, and its chase is a business of necessity; its skin, its flesh, its oil, its intestines, are alike valuable.

According to Fabricius, these seals leave the coast twice a year: at first in March, returning in May; again in June, and reappear in September. Their young, one, rarely two, at a birth, are brought forth in spring, and are suckled on the ice far from shore. They avoid the fixed ice, but live and sleep in vast herds near the floating ice-islands, among which they are sometimes seen swimming in great numbers under the guidance of one who seems to act as leader and sentinel for the whole. Their food consists of all kinds of fish, shell-fish included, but they prefer the arctic salmon. When on the feed, and one comes to the surface to breathe, he lifts his head only above the water, and quickly dives without changing his place. These seals swim in many attitudes, on their back, on their sides, as well as in the ordinary position, and occasionally whirl themselves about, as if in sport. They sleep frequently on the water, and are considered incautious, especially on the ice.

Calocephalus discolor, Marbled Seal: Blackish-brown or deep gray marked with twisted and irregular lines of whitish-gray. Under parts lighter, and the grayish lines broader and yellower. Sometimes the whitish-gray of the belly is more extensive, ascending to the sides. Size, similar to that of *Calocephalus vitulinus.*

Locality, coasts of France, and other parts of the Continent.

This was at first thought to be a variety of *Calocephalus vitulinus,* or one of that species exhibiting a modification of colouring from age or sex. Baron Cuvier observes that it does not appear to be a variety of the last-named species proceeding from age and sex only; but, he adds, that its cranium does not show a sensible variation from that of the common seal. Dr. Hamilton states that Professor Nilsson regards it as a distinct species, giving it the name of *Annellata.*

Genus *Stenorhynchus.* — Muzzle prominent; teeth composed of a long, median, rounded, cylindrical tubercle, curved backwards, and separated from two other tubercles which are rather smaller, one anterior and one posterior, by deep notches. Claws very small.

Two species only of this genus appear to be known, namely, *Phocaleptonyx,* De Blainville; the *Small-Nailed Seal,* or *the Sea Leopard.* Of the natural history of the first-named species, which is a native of the Falkland Islands and New Georgia, little or nothing seems to be known; and the accounts of the latter, a native of the South Shetlands, are very meagre, though there is a very accurate description by Dr. Hamilton, in

the 'Naturalist's Library' ('Mammalia,' vol. viii.). Professor Jamieson appears to have been the first who referred the species to F. Cuvier's genus *Stenorhynchus*.

Genus *Pelagius*, F. Cuv.—Muzzle enlarged and elongated at its extremity; chanfrein very much arched; upper incisors notched transversely at their extremity; lower ones simple; molars thick and conical, having before and behind small rudimentary points only.

Example.—*Pelagius Monachus; Phoque à Ventre Blanc* of the French; *the Monk Seal.*

Hair short, smooth, and shining; dark-brown, mixed with gray on the neck and head, above; white below. No external ear. Whiskers smooth and strong. Length from 7 to 10 or 12 feet. Locality, the Adriatic, and coasts of Sardinia.

Genus *Stemmatopus*, F. Cuv. — Head surmounted by a peculiar organ, in the form of a tumid crest (whence the name of the genus), the nature of which is not well known. Molars with simple roots, short and wide, and striated only on their crown; muzzle narrow and obtuse.

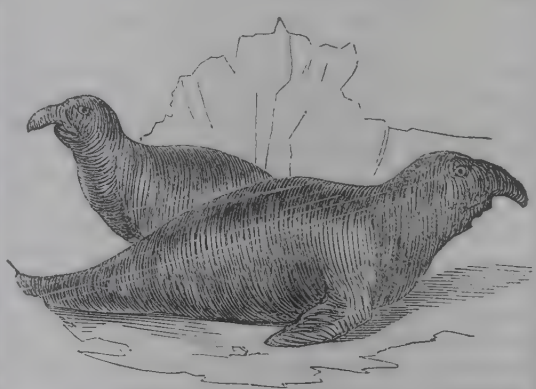
Example.—*Stemmatopus cristatus; Phoca cristata*, Gmel.; *Phoca leonina*, Fabr. About two inches from the extremity of the upper jaw, on the superior surface, a cartilaginous crest rises, increasing rapidly in height as it passes backwards, about seven inches high at its posterior or vertical edge, which is separated into two planes by an intervening depression an inch deep. The superior edge is slightly convex, and the whole structure is an elongation of the septum of the nose, the true nostrils opening on each side of it by an oblong figure. This crest runs into the hood or sac-like appendage of the head. This hood is strongly muscular, with an aggregation of circular fibres round its external orifices, which are two, situated at the lower anterior part of the head. These probably answer the purpose of sphincters, so as perfectly to close the sac. The length of the upper jaw beyond this crest is chiefly attributable to the intermaxillary bones, which are long and broad. The eye is very peculiar, perfectly spherical, with the nerve entering directly in the axis of the ball. The sclerotic or external covering is divided at its middle entirely round, its two edges being connected by an elastic membrane thickly covered by muscles. The posterior half is subdivided into four longitudinal segments, extending from its edge to within a quarter of an inch of the entrance of the optic nerve. This structure, by elongating the axis of vision, may enable the animal more clearly to discern distant objects, and also, by the reverse, to draw the eye deep within the socket during repose, especially as there are no moveable eyelids, but only the membrana nictitans; the lens is spherical; the iris is broad, and evidently muscular. Fur soft and long, woolly beneath; black in old individuals, silvered beneath; white and gray in young specimens, spotted irregularly with brown. The dilateable sac which crowns the head is covered with short brown hair. Length seven to eight feet.

Habits, &c.—This species, which especially haunts the open sea, is said to visit the land in April, May, and June, chiefly. They are found for the most part on large ice-islands, where they sleep without precaution; and occur in great numbers in Davis's Straits, whither they are stated to make two voyages a year, in September and March. They depart to bring forth their young, and return in June, very lean and exhausted. In July they proceed again to the north, where they appear to procure plenty of food, for they return in high condition in September. The crested seal is said to be polygamous, and to rear its young on the ice. Its bite is formidable, and its voice is stated to resemble the bark and whine of a dog. When surprised by the hunter, it weeps copiously. Among themselves they have fierce encounters, and inflict deep wounds in the conflicts with their claws and teeth.

This is one of the species most generally pursued, and, together with the Rough Seal (*Calocephalus hispidus*), furnishes the greatest number of skins brought to Great Britain. The natives clothe their women with the skins of the young, and cover their boats and houses with the skins of the old ones. They head their hunting-spears with the teeth, and blow up the stomachs into fishing-buoys.

Genus *Macrorhinus*, F. Cuv.—Incisor teeth curved like the canines, but smaller; canines strong and well developed; molars with simple roots, larger than the crowns, which last resemble a pedunculated mammilla.

Example.—*Macrorhinus proboscideus.*



Elephant Seal, Male (*Macrorhinus proboscideus*).

Male.—Nose prolonged into a kind of proboscis, which respires violently when the animal is excited, or is elongated in the form of a tube about a foot long, when it is preparing for attack and defence. When the animal is in a state of repose, the nostrils are shrunk, and the proboscis flaccid, giving the face a larger appearance. No external ears. Whiskers strong, coarse, long, and screw-twisted. Eyes very large and prominent. Swimming-paws very well developed, the nails very small. Hair short and close. Colour grayish or bluish-gray; rarely blackish-brown. Length from 20 to 30 feet. Girth from 15 to 18 feet.

Female. — No proboscis. Dark olive-brown above, shading away to a yellowish-bay upon the belly. Under part of the cheeks and chin approaching a full dark brown, and rather longer there than elsewhere. Hair lying in patches in all

directions, giving a spotted appearance to the body, somewhat like watered silk. No nails on the hind toes.

Localities, the southern hemisphere, both in the Atlantic and Southern Oceans, between 35° and 55° S. lat., Kerguelen's Land, South Georgia, Juan Fernandez, South Shetland, and the Falkland Islands.

This is the *Phoque à Trompe* of Péron; *Phoca proboscidea*, Desm.; *Elephant Marin* of the French; *Sea-Elephant* and *Elephant-Seal* of the English; and *Bottle-Nose* of Pennant.

An extensive fishery of this huge species is maintained for the sake of its skin and oil; and vast numbers are annually destroyed. The skin, though not valued for its fur, is extensively used for carriage and horse harness on account of its thickness and strength. The oil obtained is clear and inodorous, and is said never to become rancid, nor to give out any disagreeable savour in cooking. The quantity afforded by a large individual amounts to 1400 or 1500 lbs., for the blubber is often a foot deep. It is prepared like that of whales, excepting that the operation is performed on shore. This oil is employed in England chiefly in the manufacture of cloth; it is used to a considerable extent in China.

Genus *Arctocephalus*, F. Cuv.—Head with a narrow retracted muzzle. The four intermediate incisors of the upper jaw separated in their middle by a deep notch; the lower incisors notched from before backwards. Molars with a single root, less thick than the crown, which consists of a tubercle, furnished at its base before and behind with a smaller tubercle. External ears.

Example.—*Arctocephalus ursinus*. Size of a large bear. Girth at the shoulder five feet, near the tail twenty inches. Fur brown, acquiring a grayish tint at the point of the hairs in old age. External ears one inch eight lines long, conical, erect, covered with short hair, and opening by an oblong slit, which is shut in the water. Nails very slender and minute. Length 7½ feet.

Localities, the islands on the north-west point of America, Kamtchatka, and the Kurile Islands.

This is the *Otaria ursina* of Desmarest; *Phoca ursina* of Linnæus; *Ursus marinus* (Sea Bear) of Steller; *L'Ours Marin* of Buffon; the *Ursine Seal* of some authors.

These seals are migratory in their habits, and appear off Kamtchatka and the Kurile Islands early in the spring. They are in high condition, and the females are pregnant. They remain on or about the shore for two months, during which the females bring forth. They are polygamous, and live in families, every male being surrounded by a crowd of females (from 50 to 80), whom he guards with the greatest jealousy. These families, each, including the young, amounting to 100 or 120, live separate, though they crowd the shore, and that to such an extent on the islands off the north-west point of America, that it is said they oblige the traveller to quit it and scale the neighbouring rocks. Both male and female are very affectionate to their young, and fierce in their defence; but the males are often tyrannically cruel to the females, which are very submissive. If one family encroaches on the station of another, a general fight is the consequence. They will not, in fact they dare not, leave their stations, for if they did they must encroach on that of some other family. Steller relates that he had been beset by these seals for six hours together, and was at last obliged to climb a precipice to get rid of the infuriated animals, at the imminent peril of his life. They have their war-notes and several other intonations. When amusing themselves on the shore, they low like a cow, chirp like a cricket after a victory, and, when they are wounded, cry like a whelp. They swim very swiftly, and are as great a terror to other seals as the Sea-Lion is to them.

The skins of the young are highly prized for clothing; and Steller speaks of a garment which he had made for himself from one, when he was in Behring's Island, with grateful remembrance.

Genus *Platyrhynchus* (F. Cuv.).—Incisors pointed; molars with no secondary point, except at their anterior part. Cerebral region very much elevated, and the muzzle much more enlarged than in *Arctocephalus*. The complete number of teeth the same as in that genus. External ears.

If a number of species have been confounded under the name of Sea Bear, there have been several honoured with the name of Sea Lions, and among them the Elephant Seal above noticed.

Dr. Hamilton records three species:—1, *the Sea Lion* of Steller (*Phoca jubata*, Gmel.); 2, *the Sea Lion* of Forster (*Leo Marinus*, Buff.); and 3, *the Sea Lion* of Pernetty (*Platyrhynchus leoninus* of F. Cuvier). To the first of these he assigns the eastern shores of Kamtchatka and the Kurile Islands and as far as Matsmai, adding that they abound in Behring's Island, and that Steller also saw them in abundance on the coasts of America in July; he assigns the southern hemisphere to the second, and the Falkland Islands to the third.

Sea Lion of Forster.—Skin thick. Hair reddish, yellowish, or dark brown; no fur or short woolly hair under the long hair. A mane on the neck of the male reaching to the shoulders. Head small in proportion to the body, which is everywhere equally thick-looking, as Buffon describes it, like a great cylinder, more suited for rolling than walking. Ears conical, about 6 or 7 lines long, cartilage firm and stiff, but yet rather curled at the margin. Upper lip overhanging the lower, both furnished with long, coarse, black whiskers, which become white with age. Length from 10 to 14 feet; the females shorter and more slender.

Captain Cook states that it is not at all perilous to go among these animals, for they either fled or stood still. The only danger was in going between them and the sea; for if they took fright at anything they would come down in such numbers, that the person in the way would be run over. When he and his party came suddenly upon them, or waked them out of their sleep, they would raise up their heads, snort and snarl, and look fierce, as if they meant to devour the intruder; but when the men advanced, the Sea Lions always ran away. He states that the male is surrounded by from twenty to thirty females, and that he is

very attentive to keep them all to himself, beating off every male that attempts to come to his flock. Others, again, had a less number, some no more than one or two; and here and there was seen one lying growling in a retired place, suffering neither males nor females to come near him. These he judged to be old and superannuated.

Genus *Halichœrus* (Nilsson).—Head very flat; muzzle very deep. Molar teeth of the upper jaw consisting of a simple point without tubercles; those of the lower jaw with a rudimentary tubercle before and behind the principal point. The number of incisors given in Mr. Bell's vignette ('British Quadrupeds') is six in the upper jaw, and the same number apparently belong to the lower.

Example.—*Halichœrus griseus*. Locality, seas of North Europe; the Baltic; coasts of Pomerania; south coast of Ireland.

This is the *Phoca gryphus* of Fabricius; *Phoca barbata*, Fleming; and the *Long-Bodied Seal* of Parsons.

Professor Nilsson states that in the Baltic this seal is solitary; Mr. Ball however says that on the south coast of Ireland he has seen it in small parties, and he learned from the fishermen that they had noticed as many as thirteen congregated on a rock. The same author has heard them in a cave baying like large dogs. Length from 7 to 8 feet.

Walrus, or *Morse*. Genus *Trichechus*.

Description.—Head well proportioned, round, obtuse, eyes small and brilliant, upper lip remarkably thick, covered with pellucid whiskers or bristles as large as a straw. Two very large canines (in the upper jaw only) directed downwards. Nostrils large, rounded, placed on the upper part of the snout. No external ears.

In adults, according to Mr. MacGillivray, the incisors are obliterated, except the lateral pair of the upper jaw; the fifth grinder also disappears, and sometimes the fourth.

Though the general structure of the skeleton in the Walrus resembles that of the Seals, there is a striking difference in the cranium and the teeth. In the adult lower jaw there are neither incisors nor canines, and the lower jaw itself is compressed anteriorly so as to fit between the two enormous tusks (canines) of the upper jaw, which are sometimes two feet long and proportionably thick, and directed downwards. The great alveoli, or sockets for containing these formidable teeth, produce the characteristic form of the skull of the Walrus, and make the anterior part of the upper jaw present an immense convex muzzle, the nostrils having an upward direction, and not terminating at the snout. All the molars are cylindrical, short, and truncated obliquely. Between the two canines are two incisors similar to the molars, but Cuvier observes that the greater number of authors have not considered them as incisors, although they are implanted in the intermaxillary bone; and between them, besides, in young individuals, are two small pointed teeth.

The stomach and the intestines are nearly the same as those of the Seals.

Example.—*Trichechus Rosmarus*. This is the *Walrus*, *Sea-Horse*, *Morse*, and *Sea-Cow* of the British; *Morse*, *Vache Marine*, *Cheval Marin*, and *Bête à la Grande Dente* of the French. It is the *Horse-Whale* or *Whale-Horse* (*Hval-Ros*) of Octher, the Norwegian, who, about the year 890, made his report of it to Alfred, as having tusks of great price and excellency, some of which he brought the king on his return from his voyage beyond Norway.

Description.—Neck short, body very bulky, broadest round the chest, and diminishing towards the very short tail. Hair close; colour, according to Fabricius, varying with age, the young being black, then becoming brown, and gradually paler and paler, till the animal in old age becomes white. Limbs very short. Inside of the flippers defended by a horny kind of coat, or callus, produced, in all probability, by climbing over ice and rocks. Length from 10 to 15 or even 20 feet in the case of the largest bulls. Girth 8 or 10 feet, and upwards. Length of the tusks when cut out of the skull generally from 15 to 20 inches, sometimes 30, and their weight from 5 to 10 lbs.

Walrus (*Trichechus Rosmarus*).

Localities, the Icy Sea and Northern Ocean, Spitzbergen, Nova Zembla, Hudson's Bay, Gulf of St. Lawrence, &c. Rare on the north coasts of Britain.

It would appear that the Walrus feeds principally upon marine plants (*Fucus digitalus*), but animal food is not rejected; for Mr. Scoresby found in the stomachs of some individuals, shrimps, a kind of craw-fish, and the remains of young seals.

The Walrus is monogamous, and the female is said to bring forth her young only one at a birth, either on the shore or on the ice. Habits gregarious. In the North Pacific Ocean, Cook observed them on the ice lying in hundreds, huddling over one another like swine, and roaring and braying very loudly; indeed in the night or in foggy weather, they gave the voyagers notice of the vicinity of the ice before it could be seen. They were seldom in a hurry to get away till after they had been once fired at, when they would tumble over each other into the sea in the utmost confusion. Vast numbers of them would follow the boats and come close up to them, but

the flash in the pan of a musket sent them down instantly. Before they were put upon their guard by persecution, as many as 300 or 400 were killed at a time. That they are not without courage or sympathy for their wounded companions, there is ample testimony. When Martens wounded one, others speedily surrounded the boat, and whilst some endeavoured to pierce it with their tusks, others raised themselves out of the water and endeavoured to board her. Their parental affection is great. The boats from the Resolution and Discovery were hoisted out to attack sea-horses in Behring's Straits. Captain Cook states that on the approach of the boats to the ice all the Walruses took their cubs under their fins, and endeavoured to escape with them into the sea. Several whose young were killed and wounded, and were left floating on the surface, rose again and carried them down, sometimes just as the people were going to take them into the boat; and they might be traced bearing them to a great distance through the water, which was coloured with their blood. They were afterwards observed bringing them up at times above the surface, as if for air, and again diving under it with a dreadful bellowing. The female in particular whose young had been destroyed and taken into the boat, became so enraged that she attacked the cutter, and struck her tusks through the bottom of it.

The tusks, the skin, and the oil of the Walrus are valuable; the flesh is regarded as excellent by the natives of the Arctic regions.

SEAMEN. [Ships.]

SEARA. [Brazil.]

SEARCH, RIGHT OF. The general principles upon which that part of the Law of Nations is constructed which respects the usages to be observed towards neutral powers in time of war by the belligerent powers have been explained under the head of Blockade. Here it is only necessary further to remark that manifestly no other right can be exercised by the belligerent over the ships of the neutral without the right of visitation and search. The existence of that right, accordingly, is admitted as the rule, whatever may be the exceptions.

In the exercise of the right of search upon a neutral vessel, the first and principal object of inquiry is generally the ship's papers. These are, the passport from the neutral state to the captain or master; the sea letter, or sea brief, specifying the nature and quantity of the cargo; the proofs of property; the muster-roll of the crew, containing the name, age, rank or quality, place of residence, and place of birth, of each of the ship's company; the charter party; the bill of lading; the invoices; the log-book; and the bill of health.

The penalty for the violent contravention of the right of visitation and search, is the confiscation of the ship and cargo; and a rescue by the crew after the captors are in actual possession is considered as the same thing with a forcible prevention. In either case the resisting ship may be seized in the same manner as if it belonged to the enemy, and, being brought into port, will be condemned as a prize.

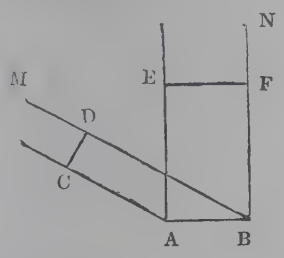
Of course, any of the belligerent powers may agree with any of the neutral states that the right of search shall only be exercised in certain circumstances; and this is the first limitation that falls to be noticed. That the mere presence of a ship of war should protect from search the merchantmen under its convoy has never been admitted by Great Britain.

It is now universally admitted that the right of visitation and search cannot be exercised upon a ship of war, or public or national vessel, itself; and this is the second limitation of the right. It is strange that there should ever have been any doubt or dispute upon this point; and yet it has been so several times. In the course of the controversy that arose respecting the rights of neutrals out of the Berlin and Milan Decrees of the French Emperor and our own Orders in Council, in 1806 and 1807, while some extreme partisans on the one side contended that even merchant ships were not liable to search when under the convoy of a man-of-war, others on the opposite side revived the old pretension of the English republican government of 1653, and maintained our right of visiting and searching the ships of war themselves of neutral states. The principle was then applied to the visitation of the ships of war of the United States of America for the purpose of recovering seamen alleged to be subjects of this country and deserters from the British service. This pretension was ably discussed, and its unwarrantable character demonstrated, in an article published in the 'Edinburgh Review' for October, 1807, pp. 9-22; but before this paper appeared an actual enforcement of the new doctrine had occurred in an attack made, on the 23rd of June, by the British ship of war, Leopard, upon the American frigate Chesapeake, lying off the Capes of Virginia. On the refusal of the American captain to permit his ship to be visited, the Leopard fired into the Chesapeake, which, being unprepared for action, immediately struck her flag. Four men were carried off. President Jefferson immediately issued a proclamation interdicting all armed British vessels from the harbours and waters of the United States, and forbidding all supplies to them, and all intercourse with them. The American minister in London was also directed to demand satisfaction of the British government. Negotiations were continued for a long time without any result. The affair of the Chesapeake soon became complicated with other incidents; and at last the American government objected to the search not only of ships of war but even of merchant vessels for deserters. It was not denied that the search of merchantmen was sanctioned by the law of nations, but the exercise of the right was declared to be irritating and fraught with danger, and it was urged that it should on that account be abolished. In the end war broke out between the two countries in the summer of 1812; but even that did not settle any of the questions that had arisen between them in connection with the right of search. The treaty of peace signed at Ghent on the 24th of December, 1814, contained no stipulation on that subject.

The right of visitation and search, however, is

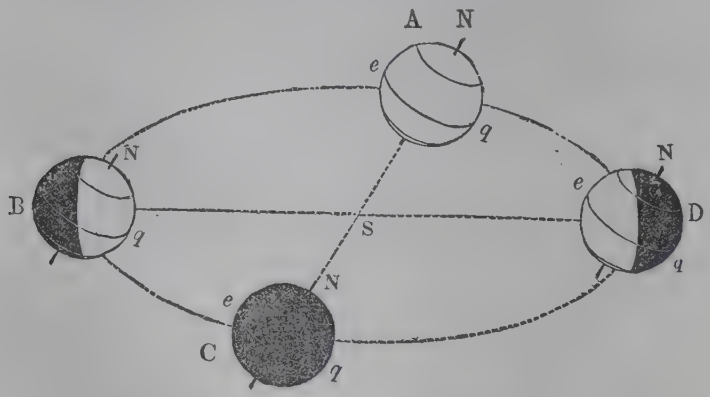
not confined to a time of war. Its exercise has always been admitted to be equally allowed by international law in time of peace. The question of the seizure by one country of its subjects serving in the mercantile navy of another, which was one of the main subjects of dispute between England and America before the breaking out of actual hostilities in 1812, may arise in a time of peace as well as in a time of war. The chief questions connected with the right of search, the number of which is greatly reduced in a time of general peace, are those relating to the trading rights of neutrals; but even of these some remain. Of late years however the right of search has become principally important in reference to the trade in slaves, which has now been declared to be illegal by most of the great maritime states. But it is only by express agreement that the free exercise of the right can be established. England, which has been foremost in the attempt to suppress the slave trade, has never objected to the exercise of the right of search for this, or indeed for any other legitimate object; but other nations, jealous of our predominant maritime power, have been extremely reluctant to concede it in this particular case.

SEASONS, CHANGE OF. The phenomena of the seasons may be divided into those which always recur every year and those which are different in different years. We have in every year the same succession of longer and shorter days, with a summer and winter; while the summer of one year is of a higher temperature, and accompanied by finer days, than that of another. The unvarying phenomena can be explained by what we know of the sun's (or earth's) motion; the varying phenomena belong to the science of meteorology, and depend upon atmospheric and other circumstances, with which we have little or no acquaintance. At any given moment, the light and heat received from the sun, at any given place, depend upon the altitude of that body in two ways. In the first place, the lower the sun is the greater the thickness of the portion of the atmosphere which its rays have to traverse before reaching the spot; the greater then is the light and heat which is lost in the passage. In the second place, the less the altitude of the sun the less the actual quantity of light and heat which falls upon any given spot. If AB be the dia-



meter of a circular portion of the earth's surface, and if the sun be seen in the direction BM, the light which falls on that circle is a cylinder of rays with the diameter CD; but if the sun be seen vertically, or in the direction BN, the cylinder of rays has EF for its diameter, besides which, the rays of the first cylinder are weaker than those of the second, as having passed through more of the atmosphere. Neglecting this latter consideration, the quantities of light and heat received when the sun is at two different altitudes are as the sines of those altitudes. Thus, the sine of 30° being ½ and that of 90° being 1, the quantity of light which falls on a given spot when the sun is vertical is double of that which falls when its altitude is 30°.

The earth's axis preserves its direction throughout the whole of the yearly motion. The consequence is, that places which are distant from the equator have very unequal days at different times of the year. The accompanying figure, which is generally given in connection with this subject, represents the earth in its four principal positions:



the sun being at S, and N being the north pole of the earth. A is at the vernal equinox, the intersection of the equator and ecliptic passes through the sun, and days and nights are equal all over the world. B is at the summer solstice, where the sun is most above the equator on the northern side; the diurnal circles north of the equator have more day than night, and have their longest days; and vice versâ. C is at the autumnal equinox, the phenomena of A being repeated. D is at the winter solstice, where the sun is farthest from the equator on the southern side; the phenomena of B are now reversed, the days being shortest on the north side of the equator. This figure very well explains the variation of days and the main reason for the phenomena of seasons in the extra-tropical parts of the earth. It is evident that, speaking of the northern hemisphere, the sun,

being above the equator, gives not only longer days, but greater altitudes; more powerful light and heat, and more of it in duration.

The average temperature being nearly the same in different years, the northern side of the earth must be receiving more than it parts with during a portion of the year, and parting with more than it receives during the remainder. The summer half of its year is that half during which it gains, on the whole, more than it parts with; the surplus being that which is lost during the winter half. The day in which most heat is received is the longest day; but it is notorious that the hottest weather is generally some time after the longest day. This is easily explained, as follows:—The time of greatest heat is not that at which most heat is received, but that at which the quantity of heat is the greatest, namely, just before the daily receipts of heat begin to fall short of the daily expenditures. As long as the receipt exceeds the expenditure, heat is daily added to the hemisphere, and the weather becomes hotter. The same reason may be given for the greatest cold generally following the shortest day with a considerable interval. All these circumstances however depend much on the atmospheric circumstances of the year.

The preceding explanation does not serve for the tropical climates; the days and nights are here so nearly equal throughout the year that seasons are caused more by the effect of the winds (which are very regular, and depend mainly on the sun's position) than by the direct action of the sun's light and heat. The seasons are not a summer and a winter, so much as recurrences of wet and dry periods, two in each year.

SEBACIC ACID, obtained from suet or lard, is in small colourless needles; it is inodorous, has a slight taste, is heavier than water, and forms with the alkalies neutral soluble salts. It consists of $C^{10} H^8 O^3$.

SEBASTIAN, DOM, the posthumous son of the Infante Dom Joam, by Joanna, daughter of the Emperor Charles V., was born at Lisbon, July 20, 1554. After the death of his grandfather, Joam III., in 1557, Sebastian, then only three years old, ascended the throne of Portugal, the regency being vested in the widowed queen, Catherine of Austria. At the age of twenty (in 1574) he undertook a campaign against the Moors of Africa, in which he gained no advantage. Soon afterwards, Muley Mohammed, sultan of Fez and Marocco, having been deposed in favour of his uncle Abdu-l-Málik, applied to Sebastian, who promised to replace him on his throne. He landed with a large force at Arsila, July 10, 1578, where he was joined by Muley Mohammed at the head of his army. Abdu-l-Málik, whose army was far superior to that of the Christians, met them on their way to Larache, and, crossing the river Luk at once offered battle. The contest was very obstinate; but it being at length apparent that the Christians were losing, the retainers of Sebastian earnestly entreated him to fly; but he refused, and plunged into the thickest of the fight, where he met his death. Mohammed succeded in escaping from the field; but was drowned whilst attempting to cross the river. Abdu-l-Málik however had also been slain during the action, though his death was kept secret till after the battle was terminated.

The news of Sebastian's death caused the greatest consternation. The Portuguese could scarcely believe in his death, and for many years after it was supposed that he was still living in captivity. This belief produced several impostors, such as Alvarez, the stone-cutter, Gabriel de Espinosa, called by the Spaniards el Pastelero de Madrigal, and two others, who ended their days on the scaffold or in the galleys. By the death of Sebastian without issue, the kingdom of Portugal became for a time annexed to Spain.

SEBASTIAN, SAN, a town in Spain, capital of the province of Guipuzcoa, is situated at the mouth of the river Urumea, between two arms of the sea which form a peninsula. The streets are clean and wide, and the houses well built. The Plaza Nueva is surrounded by fine buildings. San-Sebastian is a place of great strength, being surrounded with walls, and defended by bastions and half-moons, besides having a strong citadel called 'La Mota' upon an almost circular mountain of considerable height. The harbour is small, but very secure, being nearly enclosed by two moles, and protected from winds by the neighbouring hills. A wooden bridge on eight piers joins the two banks of the Urumea. The English besieged and bombarded San-Sebastian in July, 1813; but, on attempting to storm, they were repulsed by a sally of the French garrison, and compelled to raise the siege. After the defeat of the French at the foot of the Pyrenees, on the 30th of the same month, the siege was renewed, and continued till Sept. 9, when the French surrendered, after a most heroic defence. In 1823, when the French entered Spain, they got possession of San-Sebastian by capitulation. During the late civil war, in the northern provinces of Spain, the town was the head-quarters of the British auxiliary legion, under General Evans. The population of San-Sebastian is about 10,000.

SEBASTOPOL, or SEVASTOPOL, a town in the Russian province of Taurida, which occupies the site of the Tartar village of *Akhtiaz*, is situated on the western coast of the Crimea, in 44° 36′ 51″ N. lat., 33° 31′ 8″ E. long., and has 38,000 inhabitants, including the military. It is the station of the Russian Black Sea fleet; it is a free port and has the finest harbour in the Black Sea. The town is built on an eminence, and has broad straight streets. The houses are all of stone, and the public buildings, the Admiralty, the Arsenal, the barracks, the hospitals, the Lazaretto, and other establishments, such as the docks and dockyards, are on the most extensive scale. The town is strongly fortified. The bay which forms the harbour runs nearly five miles into the land, is from 600 to 800 fathoms broad, and from 10 to 12 fathoms deep; it is perfectly protected from all winds and has no shoals. It divides into several branches or bays, which are called by different names.

SEBENICA. [DALMATIA.]

SECAMO'NE, a genus of plants of the

natural family of *Asclepiadeæ*, found in the warm parts of India, Africa, New Holland, and in the West Indies. Some of the species of *Secamone* secrete a considerable proportion of acrid principle, which makes them useful as medicines.

SECANT, a line which cuts another; also a term in Trigonometry.

SECEDERS, the name assumed, in preference to that of Dissenters, by the most numerous body of Scottish Separatists. The term Dissenter, as being thought to imply a difference of doctrinal belief, is little used in Scotland. The Seceders agree with the national church in theory: their quarrel is, or at least originally was, merely about one or two points of practice.

The Secession originated in 1733; and was occasioned by two acts of the General Assembly; the first, passed in 1730, for putting an end to the practice of recording the protests, or reasons of dissent, given in by individual members against the decisions of the church judicatories; the other, passed in 1732, providing that in cases in which what is called the *jus devolutum* (or right of the presbytery to nominate to vacant livings in consequence of no qualified person being presented by the patron within six months) came into operation, the presbytery should always appoint the person chosen by the heritors and elders.

The clergyman who took the lead in the movement against these acts was the Reverend Ebenezer Erskine, then one of the ministers of Stirling. He was one of fifteen members of Assembly who protested against the passing of the act of 1732. The Assembly having (in conformity with the act of 1730) refused to record this protest, Erskine inveighed against the proceeding as arbitrary and tyrannical, in a sermon which he preached a few months after before the synod of Perth and Stirling. He and three clergymen who adhered to him were suspended by the Commission of Assembly in August, 1733, and were deposed in the November following. This sentence however was removed by the Assembly of 1734, which at the same time repealed both the act of 1730 and that of 1732. But in the meantime the deposed brethren, having been joined by four other clergymen, had constituted themselves into a separate presbytery; and they now refused to rejoin the general body of the church, until, as they said, they should have satisfactory evidence that its future conduct would be such as they could approve of. They were finally deposed, and their parishes declared vacant by an act of the Assembly, May 15, 1740, by a majority of 140 to 30.

The Seceders, or Associate Synod, as they called themselves, remained for some time a united body, but ultimately split up into various divisions. All the divisions we believe agree in adopting as their standards, in addition to the Westminster Confession of Faith, what is called the First or Extra-Judicial Testimony, emitted by their founder Erskine and his brethren in 1733, and a more extended exposition of their principles and views, known as the Second or Judicial Testimony, which they published in 1736.

SE'CKENDORF, VEIT LUDWIG VON, was born Dec. 20, 1626, at Herzogenaurach near Erlangen. His father held a high post in the army of Gustavus Adolphus during the Thirty Years' War. The boy began his studies at the gymnasium of Coburg in 1638; but Ernest, duke of Gotha, invited him to the gymnasium of Gotha; and after the death of his father, acted towards the youth with all the care of a father. After completing his education at the university of Strasburg, Seckendorf gradually rose to the highest offices in the duke's service, and in 1664 he was appointed privy councillor and chancellor. At the close of 1664, he left the service of the Duke of Gotha, and entered that of Moritz, duke of Zeitz, who appointed him his privy councillor, chancellor, and president of the consistory. When Duke Moritz died in 1681, he retired to his country-seat near Altenburg. In 1691 Frederic III., elector of Brandenburg, invited him to Berlin as his privy councillor, and also appointed him chancellor of the University of Halle. Seckendorf accepted the offer, but died in 1692, at Halle. Seckendorf as a statesman showed great judgment and skill, but he was more distinguished as a political writer, an historian, a scholar, and a theologian. His principal political work is—'Deutscher Fürstenstaat,' Gotha, 1665, which for a long time was thought the most useful manual of political science.

SECKER, THOMAS, was born in 1693. He was sent to an academy at Attercliffe, about 14 miles from Chesterfield, in Derbyshire, intended for the education of dissenting ministers. After a residence of two or three years, he was removed to an establishment of the same kind at Tewkesbury.

After he left this academy he preached among the dissenters occasionally, but never became the settled pastor of any dissenting congregation. Indeed he soon determined to abandon the path which had been appointed for him, and devoted himself to the study of medicine, attending lectures in London, and going afterwards to Paris.

Soon afterwards however, owing to the persuasions of his friend Butler, the author of the 'Analogy,' and other persons, Secker was induced to consider the question of conformity, and the result of his deliberations was a determination to enter the church. He entered himself at Exeter College, Oxford, and was ordained by the Bishop of Durham in 1723.

His progress was rapid. He was made chaplain to Bishop Talbot; had the living of Houghton-le-Spring, which he soon exchanged for that of Ryton, both in the diocese of Durham; but in 1732 he was brought into a more public sphere of action, being nominated one of the king's chaplains, and rector of St. James's, Piccadilly. Early in 1735 he was made Bishop of Bristol; in 1737 he was translated to Oxford; in 1750 he was made dean of St. Paul's; in 1758 he became archbishop of Canterbury.

In all the various situations which he was called to fill, his conduct was that of a conscientious, liberal, and pious man: assiduous in the discharge of all his duties, acting with moderation and discretion. His printed works consist only of sermons, lectures, and charges. He died Aug. 3, 1768, and is buried in Lambeth churchyard.

SECLIN. [NORD.]

SECOND, the sixtieth part of a minute, whether of time or of angular measure.

SECOND, an interval in music, a discord, the ratio of which is 9 : 8. Of seconds there are three kinds: the minor second, or semitone, as E F; the major second, C D; and the extreme sharp second, C D♯.

SECOND-SIGHT, a power believed to be possessed by some persons in the Highlands and Islands of Scotland, of foreseeing future events, especially of a disastrous kind, by means of a spectral exhibition of the persons whom these events respect, accompanied with such emblems as denote their fate. The belief was also held by, and was probably descended from, the ancient Scandinavians; but the superstition seems to have died away. Mr. Macculloch ('Western Islands of Scotland') says 'It has undergone the fate of witchcraft; ceasing to be believed, it has ceased to exist.'

SECONDARY PUNISHMENTS. [TRANSPORTATION.]

SECRETARY (French *Secrétaire*), one entrusted with the secrets of his office or employer; one who writes for another. Its remote origin is the Latin *secretum*. The phrase 'notarius secretorum' is applied by Vopiscus ('Div. Aurelianus,' c. 36) to one of the secretaries of the Emperor Aurelian. The first time the title of 'secretarius noster' occurs is in the 37th Hen. III., 1253.

SECRETARY OF STATE. The office of secretary of state is one of very ancient date, and the person who fills it has been called variously the King's Chief Secretary, Principal Secretary, and, after the Restoration, Principal Secretary of State. He was in fact the king's private secretary, and had custody of the king's signet. The duties of the office were originally performed by a single person, who had the aid of four clerks. The division of the office between two persons is said to have occurred at the end of the reign of Henry VIII., but it is probable that the two secretaries were not until long afterwards of equal rank.

The number of secretaries of state seems to have varied from time to time: in the reign of George III. there were often only two; but of late years there have been three principal secretaries of state, whose duties are divided into three departments—home affairs, foreign affairs, and the colonies. They are always made members of the privy council and the cabinet. They are appointed (without patent) by mere delivery to them of the seals of office by the king. Each is capable of performing the duties of all the three departments, and the offices are so far considered as one, that upon being removed from one secretaryship of state to another, a member of the House of Commons does not vacate his seat.

To the Secretary of State for the Home Department belongs the maintenance of the peace within the kingdom, and the administration of justice so far as the royal prerogative is involved in it. All patents, charters of incorporations, commissions of the peace and of inquiry, pass through his office. He superintends the administration of affairs in Ireland.

The Secretary for Foreign Affairs conducts the correspondence with foreign states, and negotiates treaties with them, either through British ministers resident there, or personally with foreign ministers at this court. He recommends to the crown ambassadors, ministers, and consuls to represent Great Britain abroad, and countersigns their warrants.

The Secretary for the Colonial Department performs for the colonies the same functions that the secretary for the home department performs for Great Britain.

Each Secretary of State is assisted by two under-secretaries of state, nominated by himself; one of whom is usually permanent, and the other is dependent upon the administration then in power. There is likewise in each department a large establishment of clerks appointed by the principal secretary.

The power to commit persons on suspicion of treason is incident to the office of principal secretary of state—a power which, though long exercised, has been often disputed. The secretary of state has also power to issue a warrant by which he may direct letters to be opened which are sent through the post-office. This power is occasionally exercised, and was the subject of much discussion in parliament in 1845.

There is also a chief secretary for Ireland, resident in Dublin (except when parliament is sitting), and he has always an under-secretary there. He corresponds with the home department, and is under the authority of the lord-lieutenant of Ireland. His office is called that of secretary to the lord-lieutenant; but it is analogous to the office of secretary of state. He has sometimes, though very rarely, been a member of the cabinet.

SECRETARY-BIRD. [GYPOGERANUS.]

SECRETION, in animal physiology, is one of the processes by which a substance is separated from the blood or an analogous organic fluid. The same term is also often applied to the material separated. Secretion differs from nutrition, in which a fluid is also at first separated from the blood, in the purpose for which it is carried on, and in the mode in which the fluid is afterwards disposed of. In nutrition [NUTRITION] the fluid is converted into the tissues of the body or into organised structures; in secretion it usually remains fluid, and if not, it never acquires any organisation.

For the account of particular secretions we must refer to the articles relating specially to them, or to the parts by which they are produced, such as BILE; GLAND; INTESTINES; LIVER; MAMMARY GLAND; MILK; MUCUS; PANCREAS; SALIVA; SKIN; STOMACH, &c.

SECRETIONS, VEGETABLE, are those products found in plants which are chiefly the result of the decomposition of carbonic acid and ammonia, and the appropriation of the carbon. [SAP.] These secretions are exceedingly numerous, and constitute the great bulk of the solid parts of the plant. The differences observed in the hardness and durability of the wood, the colour of the leaves and flowers, the flavour of the various fruits, the medicinal and economical properties of all parts of plants, are dependent on the

nature of the secretions that constitute, and are deposited within, these tissues.

In the lowest forms of plants we find the simple cell endowed with the power of abstracting from the medium in which it lives the elementary matters which it combines in those forms that are essential to its existence. In the simple cell the changes which are thus affected are very few, but as we ascend in the scale of organisation the cells are united. Their forms are varied, the functions which were performed by one cell are assigned to different sets of cells, and the compounds required by the plant and the changes in its elementary matters become more numerous and complicated.

I. *Of General* or *Nutritious Secretions.*—These are found, in one form or another, in all plants, and are sometimes collected in large quantities in various parts of the plant, to serve as material for its future growth. They have hence been called general and nutritious secretions. One set of them seem to be more immediately the result of the union of the elements of water with the carbon of the carbonic acid. They are named as follows:—1, Cellulose or Sclerogen; 2, Amyloid; 3, Vegetable Jelly; 4, Gum; 5, Starch; 6, Sugar; 7, Inulin; 8, Oil of Fat.

Cellulose is the material which composes the walls of all cells, and is insoluble in water. *Amyloid* and *Vegetable jelly* have a composition similar to cellulose. The first is found in the cotyledons of leguminous seeds, the second in the cell-walls of sea-weeds, &c.

Gum exists in a dissolved state in many of the *Cryptogamia*, also in *Malvaceæ*, *Liliaceæ*, *Orchidaceæ*, and many of the *Boraginaceæ*. The various sorts of gum-acacia found in the markets are produced from the *Acacia Arabica*, *A. Senegal*, *A. tortilis*, &c. [Gum.]

Sugar is very generally diffused throughout the vegetable kingdom, and if it does not exist in the fully-developed plant, it is always found in the seed during the germination of the young plant. [Germination.] There are several varieties of sugar, or saccharine principles, developed in plants which have received different names, as cane-sugar, or the sugar of commerce, grape-sugar, liquorice, manna, &c.

Starch, or *Fecula*, is the most abundant of the nutrient secretions of plants, and is most used by man. It occurs in the form of little granules, which are always surrounded by a delicate tissue, which becomes coloured blue by iodine. As it is the great source of nutriment for the younger parts of plants, it is found deposited in the cellular tissue in almost all the organs of plants, as in the tubers intended to nourish young shoots, in all fleshy roots and bulbs or rootstocks which have to furnish food to young stems, in the stems, the receptacles, seeds, or other parts of plants where it may be required for affording nutriment to the younger growing organs of the plant.

Inulin is found in the roots of certain plants, and differs little in composition and properties from starch.

Oils, Fat, and *Wax,* form a class of vegetable secretions differing from the foregoing in their composition. None of them contain oxygen in the proportion in which that element forms water with hydrogen, which is the case with the above-named secretions.

Another class of nutritive secretions in plants are those which contain nitrogen in addition to carbon, hydrogen, and oxygen. They have the substance called *Protein* for their basis. They are called *Albumen, Fibrine,* and *Caseine.*

Albumen, called also *Glutin* and *Emulsin,* is found in the milk of all plants, and also with the starch found deposited in various seeds. Fluids in which it is contained become flocky when exposed to heat. It is also thrown down from them by acids, alcohol, and tannin. When the tubers of the potato are submitted to heat, a glairy fluid is separated which contains glutin. In the milk of the cow-tree it is found in the greatest abundance.

Fibrine, or *Gluten,* is found in the greatest abundance in the seeds of gramineous plants. When moist, it is a white, transparent, tenacious, elastic, glutinous substance. When dry, it is colourless and scentless, and insoluble in water. It is soluble in boiling alcohol and acids, and is precipitated from the latter by ferro-cyanuret of potassium.

Caseine differs from the others, and is found in the seeds of leguminous plants.

II. *Of Special* or *Local Secretions.* — The greatest variety in the secretions of plants is in those which are not generally secreted and diffused throughout the system of the plant, but are either secreted in a particular part of plants for a special purpose, or are secreted by particular species of plants. These may be arranged under the heads of acids, alkaloids, neutral principles, resinous principles, colouring-matters, milks, oils, resins, &c.

Acids are the most numerous group of vegetable secretions, and the chemist is constantly adding new ones to their number. They are generally found in combination with the various earths and alkalis which exist in plants. The change of elements necessary for the production of acid from the starch, &c., of plants, may be seen by the following atomic analysis from Meyen ('Pflanzen Physiologie,' band ii., p. 301):—

	Amylum, or Starch.	Citric Acid.	Tartaric Acid.	Acetic Acid.	Malic Acid.	Equisetic Acid.
Carbon . . .	12	4	4	4	4	4
Oxygen . . .	10	4	5	3	4	3
Hydrogen . .	20	4	4	6	4	2

The most remarkable of the vegetable acids is tannic acid, or tannin. It is frequently placed among the neuter principles of vegetation, but it reddens litmus, combines with salts, and in other properties agrees with acids.

Alkaloids. The substances thus called resemble the alkalies of the inorganic kingdom only in the property they possess of uniting and forming salts with acids. Thay are compound bodies containing carbon, oxygen, hydrogen, and nitrogen. Although they differ little in chemical compo-

sition, yet they possess all the properties of the plant in which they are produced. The following table gives the atomic constitution of the most powerful of these alkalies:—

	Morphine.	Codine.	Narcotine.	Strychnine.	Brucine.	Quinine.	Cinchonine.
Carbon	34	32	40	30	32	20	20
Hydrogen	36	39	40	32	36	24	22
Nitrogen	2	2	2	2	2	2	2
Oxygen	6	5	12	3	6	2	1

A number of principles have been detected and described by chemists, which are neither acid nor alkaline, and have therefore been called *neutral principles*. The most remarkable of these are pollenine, berberine, asparagine, emetine, caffeine, gentianine, and fungine. Another series of these principles are those which possess resinous properties, and hence are called *resinous principles*; to these belong quassine, cathatine, elaterine, piperine, jalapine, digitaline, and several other principles named after the plants from which they are obtained.

Colouring-Matters may be divided into two classes, those which possess nitrogen, and those which are without it. In the former class is indigo, which exists in a great number of leguminous plants, and is an important article of commerce. [INDIGO.] The latter class contains the numerous red, yellow, blue, and brown colouring-matters, many of which possess peculiar properties, a knowledge of which is made subservient to the art of dyeing. Amongst these are santaline, the colouring principle of red sanders wood; polychroite, that of saffron; rheadine, that of the red poppy; rhubarbine, of rhubarb, &c.

Milks, or *Milky Fluids*, are occasionally very abundant in plants, characterising entire families. *Euphorbiaceæ*, *Papaveraceæ*, *Apocynaceæ*, *Asclepiadaceæ*, *Campanulaceæ*, *Convolvulaceæ*, and *Artocarpaceæ*, among the *Dicotyledons*, and *Liliaceæ*, *Scitaminaceæ*, *Araceæ*, and *Alismaceæ*, among *Monocotyledons*, are the orders which produce the greatest abundance of milk. The milky fluids vary in composition in different plants: some of them are poisonous, containing active principles, as the milk of *Papaveraceæ*, which contains opium; others contain caoutchouc in great abundance, and the Caoutchouc, or India Rubber, is prepared from the milk of *Ficus elastica*, and plants belonging to the orders *Apocynaceæ* and *Euphorbiaceæ*.

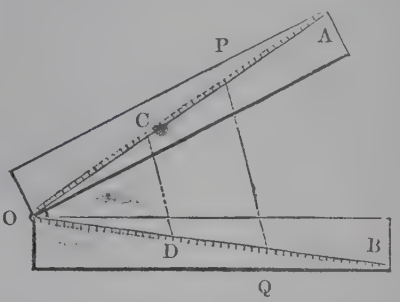
Oils are divided into two very distinct classes, the volatile and the fixed. The former are the agents which produce the various odours of plants, and can be collected by distillation from the tissues in which they are deposited. The latter exist in the cells of cellular tissue of many plants, especially the seeds, where they seem to perform the same office as starch, gluten, &c.

Resins are found deposited in the tissues of plants, but not in a regular manner, as they form passages and intercellular cavities in the midst of the tissues. They are occasionally found on the surface of plants, but this is rather the result of accident than a constant occurrence.

SECTION, the curve made by the intersection of two surfaces. In the graphical arts it means generally a plane section, and most frequently a vertical section, the horizontal section being called the plan. In architectural designs, the longest vertical section is usually called the elevation, the term section being restricted to vertical sections which are perpendicular to the elevation.

SECTOR (Geometry), the figure made by two straight lines which meet, and a curve which cuts them both. The most common is the Circular Sector, made by two radii of a circle and the arc which they include.

SECTOR (Drawing Instrument), an instrument invented by GUNTER, which has the appearance of a small carpenter's rule marked with scales in every part; the greater number of these scales not being laid down parallel to the edges of the rule, but converging towards the pivot on which the moving arm of the rule turns while the instrument is opened. These converging scales only properly belong to the sector; the others are merely laid down for convenience on such blank spaces as are left by the converging or sectorial scales.



The sector is a large number of pairs of compasses packed up into one, and most explanations of the instrument attempt to describe them all in one. It will however be more convenient to separate one pair of compasses from the rest, and to describe its use. Each piece of the ruler is marked with the same scales. Take one of these scales, OA, and that which corresponds to it, OB; then AOB is a pair of compasses which can be opened or shut at pleasure. Suppose two scales, say of chords, to be laid down on OA and OB, which are chords of 90°, OP and OQ being radii, or chords of 60°. If OP be four inches, we have then before us two scales of chords with the radius of four inches actually laid down, and any chords might be taken off them as from a common scale: for instance, if the marks of 35° be at C and D, then either OC or OD is the chord of 35° to a radius of four inches. But suppose it required to find the chord of 35°, not to a radius of 4 inches, but to one of 3.61 inches. We know that

4 : 3.6 : : ch. 35° (rad. 4) : ch. 35° (rad. 3.61);

and the fourth term of this proportion is to be found. Now this may be done with sufficient accuracy, and without any drawing, as follows:—Take a common pair of compasses, and open them to 3.61 on a subdivided scale of inches. Then open the sector until the points of the compasses are made to fall on P and Q, which, if the sector

open rather easily, may be done very quickly. We have then PQ = 3.61 inches, and CD is the chord of 35° to that radius; for by similar triangles

OP : PQ :: OC : CD;

or 4 : 3.61 :: ch. 35° (rad. 4) : CD;

whence CD = ch. 35° (rad. 3.61).

Take the compasses then, and fixing one point at C, make the other fall on D. The distance CD may then be transferred with the compasses to the paper, or to the scales of inches, according as construction or arithmetical estimation is required.

SECULAR, a name given to those variations in the planetary motions which are of long duration so that their periods are better expressed in centuries than in years.

SECUNDUS, JOHANNES, is one of the most esteemed of modern Latin poets. His verses are chiefly amatory, and modelled after Catullus, whose passionate and tender spirit he caught, without all his licentiousness. Like other learned men of the age, he took a Latin name, Secundus. His family name was Everts, which in other languages is softened into that of Everardi and Everard. His father, Nicholas or Klaas Everts, himself a learned man, and a distinguished jurist, had five sons, all more or less eminent, among whom however John's fame stands highest. He early showed that taste for Latin poetry to which he owes his reputation; but he adopted the law as his profession, and graduated with distinction at Bourges, in 1533. The Archbishop of Toledo made him his private secretary, and he thus obtained the notice of Charles V., whom he accompanied to Tunis in 1534. The climate of Africa sowed in him the seeds of a mortal disease; and he returned to Europe only to die at Tournai, Oct. 8, 1536, at the age of twenty-five.

His Latin poems are—Elegies (3 books), 'Basia,' Epigrams, Odes, Epistles, Funera (elegies in the English meaning), and Miscellanies, one book each. There are many editions, among which that of Leyden, 2 vols. 8vo., 1821, is recommended.

SECURI'FERA, a family of Hymenopterous insects, of the section *Terebrantia*. The *Securifera* are divided by Latreille into two sections, the *Tenthredinetæ*, and the *Urocerata*. The first corresponds with the genus *Tenthredo* of Linnæus; the second is composed chiefly of the Linnæan genus *Sirex*. (*Règne Animal*, vol. v., p. 268.)

SÉDAINE, MICHEL JEAN, born at Paris, July 4, 1719, died May 17, 1797, was a dramatic writer. On the death of his father, who was an architect, he was reduced to follow the trade of a stone-mason. He continued however to study, and attracted the notice of his employer, an architect named Buron, who gave him instruction, and finally took him into partnership. This service he afterwards repaid by educating the painter David, who was Buron's grandson. Sédaine made his first appearance as a dramatist in a piece taken from the 'Devil on Two Sticks,' played at the Opéra Comique in 1756, which was very popular. After writing for that theatre during several years with brilliant success, he brought out his 'Philosophe sans le Savoir,' on the more classical stage of the Comédie Française. This is esteemed his best piece, and had a great run. He also wrote for the Grand-Opéra. The well-known opera of 'Richard Cœur-de-Lion,' for which, and many other of Sedaine's works, Gretry composed the music, procured for him, at the age of sixty-five, admission to the Académie Française. His plays amount to thirty-two. There is a selection ('Œuvres Choisies de Sédaine') with a memoir, Paris, 1813.

SEDAN. [Ardennes.]

SEDATIVES are agents which produce a direct depression of the action of the vascular system, with little sensible evacuation. Some, such as the infusion of tobacco, and hydrocyanic acid, appear to destroy completely the sensibility of the heart, so that it no longer responds to the stimulus of the blood; but how this effect results is altogether unknown. Oxalic acid, when the dose is large, seems also to paralyse the heart; while in less quantities it operates differently. The peculiar mode of action of the articles entitled to be considered as pure sedatives is noticed under the heads of Digitalis, Hydrocyanic Acid, Nicotiana, &c.

Sulphuretted hydrogen, when breathed, injected into a vein or the rectum, or even applied to the skin, acts as a sedative, and in a small quantity can occasion death. Cold, when extreme, likewise acts as a sedative.

SEDBERG. [Yorkshire.]

SEDENTARY ANNELIDS, Lamarck's third order of his ninth class, *Annelids*, which order he thus defines. Animal always inhabiting a tube, out of which it never comes entirely; no eyes; branchiæ always at one extremity of the body or near it, unless the tube of the animal is open on one side throughout its length. Lamarck divides this order into three sections.

SEDE'RUNT, ACTS OF. [Acts of Sederunt.]

SEDGEFIELD. [Durham.]

SEDGES. [Cyperaceæ.]

SEDITION (from the Latin *seditio*). Sedition does not appear to be very exactly defined. It is stated to comprehend contemptuous, indecent, or malicious observations upon the king or his government, whether made in words only, or in writing, or by tokens (which last term must comprehend pictures or drawings), calculated to lower him in the opinion of the subjects or to weaken his government. All these offences fall short of treason; but they are considered crimes at common law, and punishable by fine and imprisonment.

There are also statutes against particular acts of sedition, such as seditious libels.

There are also various acts against societies established for seditious and treasonable purposes, and against seditious meetings and assemblies.

The Roman sense of Seditio, is properly a disunion among the citizens, a riot or turbulent assemblage of people for the purpose of accomplishing some object by violence or causing fear.

SEDLEY, SIR CHARLES, was the son of Sir John Sedley of Aylesford in Kent. At the age of seventeen, in 1655-6, he became a fellow-commoner of Wadham College, Oxford, and taking no degree, retired to his own county, where he

lived till the restoration of Charles II. After this event he came to London, and set up for a satirical wit, a comedian, poet, and courtier. He represented the borough of New Romney in Kent.

During the reign of James II. Sedley appears to have retired from court. At the Revolution he joined the party of William. He died August 20, 1701.

Sedley's works, with a short memoir prefixed, were published in 1722. They consist of various short amatory poems, some of his speeches in parliament, translations from the classics, and a few plays. The best of his short poems are printed in Ellis's 'Early English Poets.' His plays have very little merit.

SEDLITZ, a village in the circle of Saaz in Bohemia, with two bitter salt-springs, from which the well-known salts called Sedlitz Powders are obtained. There are several such springs in the neighbourhood, including those at Seidschuz, in the circle of Leitmeritz. Above half a million of bottles of the water of Sedlitz and Seidschuz are annually sent to all parts of Germany.

SEDUCTION. [PARENT AND CHILD.]

SEDU'LIUS, CÆLIUS, a Christian Roman poet, is generally supposed to have lived during the first half of the fifth century of our æra; but who he was and where he lived is unknown.

There are four poems which are usually ascribed to Sedulius:—1. 'Mirabilium Divinorum, sive Operis Paschalis Libri (Quatuor) Quinque,' a poem in tolerably good hexameters, which contains some portions of the history of the Old Testament and the life of Christ. 2. 'Collatio Veteris et Novi Testamenti.' This poem, written in elegiac verse, contains narratives from the Bible, so arranged that those taken from the Old Testament always appear in juxta-position with those taken from the New Testament. 3, A 'Hymnus,' written in Iambic dimeters, is a panegyric upon Jesus, and one of the best productions of the Christian poetry of the age. 4. 'De Verbi Incarnatione' is composed of verses taken from Virgil, which by slight alterations are combined into a Christian poem.

The latest editions are by J. Arntzen, Leuwarden, 1761, 8vo.; and by Faustino Arevalo, Rome, 1794, 4to.

SEDUM, a genus of plants belonging to the natural order *Crassulaceæ*. The species of *Sedum* are inhabitants of the temperate and warmer parts of the earth, and are mostly found in dry, barren, rocky, or arid situations, where nothing else will grow. Their roots appear to serve only the purpose of holding them in the ground, whilst their leaves are so constructed that they absorb moisture from the air, and prevent its being again evaporated. It is thus that they are fitted for the situations which they occupy. G. Don, in Miller's 'Dictionary,' enumerates 110 species of this genus. Many of them are British, and a number of the foreign species are cultivated in our gardens.

Sedum Rhodiola, Common Rose-Root, is found on mountains in the north of England, Scotland, and Wales. It is a glaucous plant with yellow flowers. The root, when dried, has a sweet taste and smell, and hence its common name. *Sedum Telephium*, Orpine, or Tuberous Stonecrop, is found on rocks, walls, and dry stony places, in most parts of Europe. *Sedum Anacampseros*, Anacampseros, or Evergreen Orpine, is a native of rocks on the higher mountains of Piedmont, Savoy, Switzerland, &c. It is often cultivated in gardens. It is a trailing plant, with beautiful purple flowers. *Sedum acre*, Acrid Stonecrop, is one of the most common of the genus, and is found on walls, roofs of houses, rocks, and dry places, all over Europe. When chewed in the mouth, it has a hot biting taste; hence it is frequently called Wall-Pepper. When applied to the skin, it produces vesication, and, taken internally, it causes vomiting. *Sedum album*, White Stonecrop, is a native of Europe, in dry meadows, on walls, and rocks. It is rare in England.

SEED, in Botany, is that part of a plant which contains within several coverings the embryo or young plant, and is itself covered over with the various parts of the pericarp or fruit. The seed in its young state is called the *ovule*, which is found in the interior of the ovary, or germen, at a very early period of its growth. When the ovules are first seen, they are like little warty excrescences on the inside of the ovarium, composed of delicate cellular tissue. As they increase in size they elongate, and may then be divided into two parts, a central portion, consisting of cellular tissue, called the *nucleus*, and an external covering consisting of two membranes, the outer one of which is called *primine* and the inner one *secundine*. At one end the two membranes are open, forming a hole called the *foramen*, from which the nucleus projects more or less in the early stages of its growth. As the ovule increases in size, the foramen is almost closed, and in the matured seed it is called the *micropyle*. The base of the ovule is attached to a membrane of the ovarium called the placenta, and as the ovule increases in size the portion of its tissues that connects it with the ovary becomes, relatively to the ovule, small and cord-like, and hence has been called the *funiculus* or *umbilical cord*. The point where this cord unites with the ovule becomes in the seed the *hilum*, and it is at this point also that a number of spiral vessels and ducts are observed to pass to the base of the seed, which has been called the *chalaza*. In the progress of the growth of the ovule the nucleus increases in size, and becomes hollow inside, forming a little shut sac, which forms a kind of third membrane, called *tercine*. In the interior of this sac another is formed, which, as it contains or forms a part of the embryo or young plant, is called the *sac of the embryo*. Whilst growing, the parts do not always maintain the same relations to each other that we have described, and from this circumstance Mirbel has proposed a classification of ovules. When the ovule has grown regularly, with the hilum and chalaza at the base and the foramen at the apex, it is called a *straight ovule* or *orthotropous*. Although this appears to be the normal mode of growth, it is not the most frequent. It is seen in the walnut. If in the course of growth the ovule is bent round, so that the foramen is brought near to its base, where the hilum and chalaza exist, it is called a *curved*

ovule or *campylotropous*. This is seen in the *Brassicaceæ*, *Papilionaceæ*, and *Caryophyllaceæ*. When one part of the ovule grows faster than the other, the nucleus loses its relative position; its point is in this instance directed towards the base, and the foramen is found near the hilum, and the base of the nucleus becomes situate where its apex originally was, and it carries to this point the chalaza, which is continued from the cord by means of a set of vessels called the *raphè*. This forms a third class of ovules, called *contorted ovules*, or *anatropous*. It is seen in *Liliaceæ*, *Rosaceæ*, *Ranunculaceæ*, &c.

The position of the ovule in relation to the ovary is a point of some importance in systematic botany. When it arises up from the base of the ovarium, it is called *erect;* when it originates a little above the base, *ascending;* when it hangs from the apex of the cavity, *pendulous;* when it hangs from any point below the very apex, *suspended*.

Their number is also a point of value, and when there are only few and easily counted, they are said to be *definite*. When their number is too great to be counted they are called *indefinite*.

Such is the state of the young seed up to the time of the influence of the pollen upon the stigma. Soon after this action takes place a minute vesicle makes its appearance on the summit of the inner sac of the nucleus. This vesicle increases in size, and is developed into three parts, a descending portion, called the *radicle*, and which always points to the foramen; an ascending portion, the *plumule;* and lateral or enveloping portions, the *cotyledons:* the whole constituting the *embryo*, or young plant.

Whilst the embryo is growing, the membranes which immediately surround it increase in size, and frequently become the seat of the deposition of a large quantity of amylaceous matter called *albumen*, which is deposited for the purpose of supplying the young plant with nutriment during its growth.

When the embryo is fully grown, the ovule has no further need of connection with the placenta; the funiculus or cord therefore dries up, and the scar which is left on the seed at its point of union with it is the *hilum*, or eye; and when this is fully formed, and the embryo is capable of independent growth, the ovule becomes a seed. Sometimes the umbilical cord, instead of disappearing, increases in size, forming a membrane which entirely envelopes the seed, which is called an *aril*. One of the most remarkable instances of its existence is in the nutmeg, around which a thick aril is formed, which forms the mace of the shops.

The external coverings of the seed, which are called primine and secundine in the ovule, are called the *testa*, *perisperm*, or *spermoderm*, and are nothing more than a hardened state of the ovular membranes. In some instances the seeds have broad membraneous expansions of the testa, called *wings*, by which means they fly from one spot to another, as in the *Bignonia*. Many seeds are beautifully marked with veins running in all directions; others have minute elevations and depressions, presenting a remarkable regularity and beauty of structure.

When the seed is stripped of its testa, it presents either the albumen surrounding the embryo, or the embryo itself. When the albumen is present, it varies much in character, being of a horny, oily, fleshy, or mealy consistence. These differences depend on the nature of the peculiar secretions which are mixed with fecula or starch in the albumen. There is a peculiar form of the albumen, which is called *ruminated*, and which takes place in consequence of the abstraction of certain parts by absorption and their not being again filled up. This is the case with the nutmeg.

There is sometimes found in seeds an organ between the albumen and embryo, which is the innermost membrane in a state of induration and increased in size; it occurs in all the species of the ginger tribe, and also in *Nymphæa lutea*, the Yellow Water-Lily. It is called the *vitellus*.

The embryo is the most internal of all the parts of a seed. It consists, as before stated, of the radicle, plumule, and cotyledons, to which some add the *cauliculus*, or neck, which is only the point at which the radicle and plumule meet. The *direction* which the embryo takes varies much in different orders and genera of plants. Its directions are divided by botanists into *absolute* and *relative*. The absolute directions are explained by the terms straight, curvate, falcate, uncinate, coiled up, folded up, spiral, bent at right angles, and serpentine. [EMBRYO; COTYLEDON; GERMINATION.]

SEE'TZEN, ULRICH JASPAR, was born Jan. 30, 1767, at Sophiengroden near Jever, in Oldenburg. His education was commenced at Jever, and completed in the University of Göttingen, where from 1785 to 1788 he studied medicine, the natural sciences, and especially agriculture and political economy. Here he became acquainted with Alex. von Humboldt and Link, with whom he conceived the plan of travelling into distant countries. The assistance of Baron von Zach and the Duke of Gotha enabled him to carry out his views, which were directed towards Asia and Africa. He set out from Jever, June 13, 1802, accompanied by a surgeon whom he had caused to be educated at Göttingen at his own expense. Seetzen stopped for a short time at Vienna, to learn the art of drawing plans and maps; and thence he went, by way of Bucharest and across the Balkan to Constantinople, where he arrived Dec. 12. The remainder of his life was spent in unremitting toil and travel, through various parts of Western Asia and Egypt, in the course of which he embraced Mohammedanism, externally, at any rate. In 1815 Von Hammer of Vienna was informed by Mr. Buckingham, in a letter written at Mocha, that Seetzen had suddenly died in 1811, in the neighbourhood of Taes, while he was on his way to the Imam of Sana to recover his luggage, &c., which had been seized at Mocha, and that it was generally believed that the unfortunate traveller was poisoned by the command of the Imam. The diary of Seetzen's journeys, and his maps, plans, and drawings, were for some time supposed to be lost, but nearly the whole

were recovered, and placed in the hands of Professor Kruse of Dorpat; but it does not appear that anything has been yet published. A full account of the life and travels of Seetzen is given in Brockhaus's 'Conversations-Lexikon.'

SEEZ. [Orne.]

SEGESTAN. [Seistan.]

SEGMENT (part cut off), a term which, in its general sense, needs no explanation. It is, in mensuration, most frequently applied to the part cut off from a circle by a chord.

SEGNA. [Croatia.]

SE'GNERI, PA'OLO, born in 1624, at Nettuno in the Campagna di Roma, studied at Rome under the Jesuits, and afterwards entered that Order. He became a distinguished preacher, and in that vocation he visited almost every corner of Italy with great success. He composed also 'Laudi,' or prayers in verse, of an easy and popular style, to be sung before and after his sermons. Pope Innocent XII. chose Segneri for his own preacher, as well as of the College of Cardinals, in which office he continued three years, until 1694, when he died at Rome. Segneri composed, besides his sermons, several pious tracts, such as 'Il Cristiano Istruito,' which contains excellent precepts for living a Christian life.

SEGNI, BERNARDO, born at Florence about the end of the 15th century, studied the law at Padua, but afterwards proceeded to Aquila in the kingdom of Naples, where he followed the profession of a merchant. On his return to Florence after the fall of the republic, he was employed by Duke Cosmo I. in several missions and other affairs of state; and also in translating the works of Aristotle from the Greek into Italian. His translations of the Rhetoric, Ethic, Politic, and the Treatise on the Soul, are the only parts that have been published. Segni also wrote a history of his own times and country: 'Storie Fiorentine dall' anno 1527 all' anno 1555,' which he kept secret in his lifetime. In this history he speaks with the freedom of a conscientious historian, and as such he is placed among the best writers of Italy. Segni died in 1559.

There have been two other writers of the same family: Pietro Segni, who translated and commented on the work of Demetrius Phaléreus, 'On Elocution;' and Agnolo Segni, who wrote a valuable treatise, 'Della Imitazione Poetica.'

SEGO. [Bambarra.]

SEGORBE. [Valencia.]

SEGOVIA. [Castilla-la-Vieja.]

SEGRE. [Cataluña.]

SE'GUIER, PIERRE, was one of an ancient and distinguished French family which, in the space of three centuries (1460 to 1789), is recorded to have had no less that 68 of its members raised to the highest legal dignities of France. He was born at Paris in 1504. He began life as an advocate, and, after filling various high offices, was raised in 1564 to the rank of president à mortier, the highest grade but one in the Parisian parliament. In that capacity the parliament, having refused to register an edict for the establishment of the Inquisition, deputed him to lay their remonstrances before Henri II.; and by the boldness and force of his arguments he prevented the introduction of that odious tribunal into France. He resigned his office of president in favour of his second son *Pierre Séguier*, two years before his death, which happened in 1580.

SE'GUIER, PIERRE, born at Paris, May 28, 1588, was the son of Jean Séguier, and grandson of Pierre Séguier above mentioned. Like his grandfather, he rose through various offices to the rank of president à mortier in 1633, and that of chancellor in 1635. He obtained the confidence of Anne of Austria; and during her regency rose to as high power and influence as a subject could well attain. At the breaking out of the War of the Fronde he escaped narrowly with his life, in a resolute attempt to pass the barricades to the usual discharge of his official functions; and in the sequel of those disturbances, the seals of office were for a time taken from him. He was replaced in 1656, and continued chancellor till his death, Jan. 28, 1672. He was one of the originators, and president, with the title of protector, of the Académie Française, which held its sittings at his hotel.

SE'GUIER, ANTOINE LOUIS, of the same family, being descended from a brother of the first-named Pierre Séguier, was born at Paris, December 1, 1726, and owed (1748) to Louis XV. his first step in the law, namely, the office of king's advocate in the court of the Châtelet. In 1755 he rose to be advocate-general in the parliament of Paris, which office he held, with a short interval, till the dissolution of that body in 1790. In the Revolution he was offered and refused the post of mayor of Paris; and he lived in retirement for some time, and then emigrated. After sojourning in several places he fixed his abode at Tournai, but died of apoplexy, Jan. 25, 1792, leaving a high reputation as a judge, a lawyer, and a statesman. Several of his professional speeches and some of his writings are extant, but in no collected form.

SE'GUIER, JEAN FRANÇOIS, of another branch of the same family, was born at Nismes, Nov. 25, 1703, and devoted himself early to the study of antiquities. He accompanied the learned Scipio Maffei in his travels, and resided with him till his death in 1755. Séguier then returned to his native place, and applied himself to the illustration of its splendid Roman remains. Great part of his life was occupied, in concert with Maffei, in forming a collection of all known ancient inscriptions: their work however was never published in a complete form. Séguier continued to labour on this subject to the end of his life, and left ready for the press a bulky manuscript, now in the King's Library at Paris, which however has never been printed ('Inscriptionum Antiquarum Index Absolutissimus,' &c.). He died of apoplexy, Sept. 1, 1784. His library and valuable museum of medals, natural history, &c., is now in the public library of Nismes.

SE'GUR, PHILIPPE-HENRI, Marquis de, son of the Comte Henri-François, was born Jan. 20, 1724. He distinguished himself in the wars of Italy and Bohemia, especially at the siege of Prague. He was severely wounded at Rocoux, and at the battle of Laufeld he lost his arm. By two successive and rapid promotions he was made

maréchal-de-champ and lieutenant-general. At Clostercamp he was again wounded and made prisoner. At the termination of the war he was appointed inspector general of the infantry. In 1780 Louis XVI. made him minister-of-war, and in 1783 maréchal-de-France. He was war-minister during seven years, in the course of which he introduced many ameliorations into the army. He afterwards lived in retirement till arrested by order of the Convention, in 1790; and at the age of seventy he was thrown into the prison of La Force. Fortunately his life was spared. Bonaparte, when first consul, set him at liberty, treated him with marked respect, and granted him a pension of 4000 francs. He died at Paris, Oct. 8, 1801.

SE'GUR, LOUIS-PHILIPPE, COMTE DE, eldest son of the Maréchal de Ségur, was born in Paris, Dec. 10, 1753. He entered the army, and at an early age was made colonel of a regiment of dragoons. He offered his services to the American deputies in the cause of American independence, at the same time as Lafayette and the Vicomte de Noailles, but he was not permitted to leave France till May, 1782. He entered the Delaware in Sept. 1782, and reached the camp of the French general Rochambeau, under whom he fought till the termination of the American war. He then returned to France. In the latter part of 1784 he was appointed ambassador to Russia, where he remained till 1789. In 1790 he was sent as ambassador to the court of Frederic of Prussia. Having returned to France he was twice arrested by the revolutionists in 1793, but obtained his freedom by his prompt eloquence. He then retired into the country, and became an author. In 1798 he published his 'Théâtre de l'Hermitage;' in 1800, his Histoire des Principaux Événemens du Règne de Fréderic-Guillaume II., Roi de Prusse,' 3 vols. 8vo., Paris; and in 1801, his 'Décade Historique, ou Tableau Politique, de l'Europe depuis 1786 jusqu'à 1796,' 3 vols. 8vo., Paris. In 1803 he was chosen a member of the Académie Française, and about the same time was appointed grand-maître de cérémonies to Bonaparte. After the Restoration he became a member of the Chamber of Peers. Of his subsequent works, the chief is his 'Histoire Universelle, Ancienne et Moderne,' 10 vols. 8vo., Paris, 1821. In 1824 appeared his 'Œuvres Complètes,' 30 vols. 8vo., Paris, which in 1828 were reprinted and augmented to 36 vols. He died in July, 1830.

SE'GUR, PHILIPPE-PAUL, COMTE DE, son of the foregoing, born Nov. 4, 1780, was one of Bonaparte's officers. He accompanied him in the disastrous Russian campaign, of which he wrote the history, 'Histoire de Napoléon et de la Grande Armée en 1812,' 2 vols. 8vo., Paris, 1825, a work which is very deficient in precision and judgment, and is written in a tone of exaggeration. It was severely and justly criticised by Gen. Gourgand. The Comte de Ségur was also the author of several other works.

SE'GUR, JOSEPH-ALEXANDRE, VICOMTE DE, the second son of the Maréchal de Ségur, and brother of Comte Louis-Philippe, was born at Paris in 1756. He entered the army, and rose to be maréchal-de-camp, but attached himself chiefly to the drama. He wrote 'Contes, Fables, Chansons, et Vers,' 8vo., Paris, 1801; 'Œuvres Diverses,' 8vo., Paris, 1819; 'Les Femmes, leur Condition, et Influence dans l'Ordre Social,' 2 vols. 8vo., 4 vols. 12mo., Paris, 1820; 'Romances et Chansons,' 18mo., Paris, 1820; besides a great number of comedies, vaudevilles, and operas, several of which are yet popular. He died July 27, 1805, at Bagnères.

SEINE, the Roman *Séquana*, a large river of France, rises in the hamlet of Envergereaux, 5 miles N.W. of St.-Seine, nearly in the centre of the department and on the western slope of the mountains of Côte-d'Or. Its course through the departments of Côte-d'Or and Aube, in which it passes Châtillon-sur-Seine, Bar-sur-Seine, and Troyes, is generally north-west. On reaching the north boundary of Aube, it receives the river Aube on its right bank, and turns W. by S. past Nogent-sur-Seine just below which it enters Seine-et-Marne, where having passed Montereau at the junction of the Yonne from the left bank, it winds round to the N.W., and a few miles below Melun enters the department of Seine-et-Oise. Through this department and that of Seine it flows N.N.W., as far as Paris, a little S.E. of which it receives the Marne from the right bank. Below Paris the Seine flows in a very winding channel and in a general direction of W.N.W. across the northern part of Seine-et-Oise, where it receives the Oise on the right bank; across the department of Eure, in which it passes Elbeuf, and is joined by the river Eure on the left bank; and into the department of Seine-Inférieure, where it passes Rouen and Havre, opposite which last town it enters the English channel by an æstuary 8 miles wide.

The mouth of the Seine is 260 miles distant from its source in a straight line; but so tortuous is the course of the stream, that its whole length is about 480 miles. By means of a lateral canal between Marcilly and Troyes and locks to avoid the fall at Nogent, the river is navigable from Troyes to its mouth, a distance of 370 miles. From Paris to Rouen it is navigated by small steamers and by barges 150 to 180 feet in length. 30 feet wide, and with a draft of 6 feet. The tide ascends the Seine as far as Rouen, which city is accessible for vessels of 300 tons.

Between Caudebec, where the Seine begins to widen, and Quillebeuf, the navigation is dangerous, owing to the shoals and shifting sandbanks in the bed of the river. The current skirts the right bank at Caudebec, but a little lower down it all at once crosses over to the left bank, to which it keeps nearly as far as Quillebeuf. This passage of the stream from the one bank to the other, called *La Traverse*, is the most dangerous part of the navigation; its position is marked by buoys, fastened in several instances to the extremity of the masts of sunken vessels; but the shifting sands are often swept by the tide into the cross channel, so as to alter its course and to baffle the skill of the most experienced pilots. The fact that the water flows over an extended surface with a depth known to be diminishing for centuries, and no

longer sufficient for ships of large tonnage, has led to the undertaking of important works between Villequier and Quillebeuf, the object of which is to confine the river to a narrower bed by means of embankments; a portion of this undertaking, completed in 1849, gave the satisfactory result of a deepened current, which soon swept its bed clear of sands. The importance of the navigation of the Seine may be inferred from the fact that about 3500 sea-going ships enter and leave the ports of Havre and Rouen annually, besides a large number of coasters and small craft. Owing to the windings of the river its navigation is tedious. Steamers ply regularly between Havre, Rouen, and several other towns on the lower Seine. The articles of traffic on the river include almost every description of agricultural, mineral, and industrial products, home, foreign, and colonial.

The spring tides in the æstuary of the Seine rise 23½ feet in two hours and a half. At these seasons, the rapid rise of the tide soon heaps up a mass of water above the surface of the river, which has a gentle fall not exceeding 4 inches a mile from Rouen to its mouth; the consequence is that a high wave [BORE] rushes with a tremendous roar and impetuous velocity up the river, causing a reflux in the waters of the Seine, which are pushed back as far as Elbeuf, and sometimes to Pont-de-l'Arche. The ebb of spring tides continues for nine hours and a half.

The basin of the Seine has an area of about 30,000 square miles. It is bounded S.E. by the mountains of Côte-d'Or, the plateau of Langres and the Faucilles mountains, which divide it from the basin of the Rhône; E. by the Argonne hills, an offshoot of the Faucilles, which runs along the left bank of the Meuse, and joins the heights of Ardennes; from the northern part of these last a range of hills runs W.; forming the watershed between the Seine and the Somme; the southern boundary is made up by the Morvan hills, a western offshoot of the mountains of Côte-d'Or, the Nivernais hills, and the Forêt d'Orléans, which separate the feeders of the Loire from those of the Seine; a branch of the Forêt d'Orleans, runs N.N.W., forming the western boundary of the basin, and terminating between the Seine and the Toucque. Between Paris and Havre, the Seine forms numerous islands, and flows through some of the richest land, and some of the finest river scenery in France.

SEINE, a department in France, formed out of a portion of the old province of Ile-de-France, and named from the river Seine, which crosses it from S.E. to N.W., is bounded on all sides by the department of Seine-et-Oise, and lies between 48° 43′ and 48° 58′ 30″ N. lat., 2° 9′ 30″ and 2° 33′ E. long. Its form is nearly circular; its greatest length is 18 miles, its breadth 16 miles. It covers an area of 117,498 acres, or 183.6 square miles; and had in 1846 a population of 1,364,933, which gives 7434.27 to the square mile, being 7360.52 above the average per square mile for the whole of France. It is the smallest, and as it contains the great metropolis of France, the most densely peopled of all the departments. Of the whole area, 66,117 acres or 103.3 square miles, are inclosed within the bastioned wall lately erected round Paris; but a great portion of this space is occupied by gardens, cultivated fields, and plantations of various kinds, the capital itself within the barriers, and exclusive of the suburbs, covering an area of only 8500 acres or 13.28 square miles.

The surface of the department, for the most part level, is diversified by a few hills, the highest of which, Chaumont and Montmartre, to the north of Paris, rise respectively to the height of 403 and 446 feet above the sea-level; and Mont-Valérien, in the west of the department, which is a little higher than Montmartre.

The department is drained by the Seine and its feeders, the Bièvre and the Marne; it is crossed from the eastward by the Ourcq Canal, which terminates in a fine basin at La Villette, whence the St.-Martin and St.-Denis Canals, which run into the Seine respectively at the arsenal of Paris, and a little W. of St.-Denis, derive their supply of water. The basin at La Villette supplies most of the fountains and reservoirs of Paris with water. The St.-Maur Canal, at the south-east of the park of Vincennes, crosses the isthmus of a peninsula formed by the Marne to avoid a very tedious bend in that river. All the great national roads of France, 15 in number, and the great lines of railway, concentrate on Paris; the department is also traversed by 81 departmental roads.

The principal woods are the Bois de Boulogne on the west, and the Parc de Vincennes on the east of Paris, both of which are traversed in various directions by fine drives and walks. All the great roads leading to the capital are lined with two rows of trees on each side, forming in most instances, noble avenues.

A large portion of the surface of the department is laid out in gardens, for the growth of kitchen vegetables, fruits, and flowers; wheat, barley, oats, and potatoes are grown in large quantities, considering the smallness of the area of the department; but little wine is made, and that little is all bad. A great number of milk cows, asses, and horses are kept.

Montmartre and most of the hills consist of accumulations of gypsum; excellent building stone is quarried under the southern quarters of Paris, and at various other points of the department; fine clays for porcelain and pottery, chalk, sand for glass foundries, &c., are raised.

The manufactures comprise almost every woven fabric in wool, flax, cotton, and silk; metallic articles; jewellery, watches, and clocks; glass, porcelain, furniture, hats, gloves, ribands, and small wares of all kinds; scientific instruments, and chemical products of every description, &c., &c. The commerce in these various products, and in agricultural produce, coal, timber and firewood, raw materials of manufactures, cheese, metals, salt, drugs, colonial produce, building materials, &c., is most extensive.

Commencing at the flying-bridge midway between Bercy and Charenton, the great bastioned wall that girds Paris runs westwards across the plain on the south side of the city, and a little to the northward of Grand Gentilly, Montrouge, and

Issy, striking the Seine again opposite Le-Point-du-Jour; here starting from the right bank of the river, it sweeps round sharply to N.N.E. along the eastern side of the Bois de Boulogne, which it separates from the suburbs of Auteuil and Passy; having crossed the high road to Neuilly about half a mile W. of the triumphal arch De l'Etoile, it runs N.E. and E., inclosing the heights of Batignolles and Montmartre; in the angle between the St.-Denis and the Ourcq Canals, which it spans respectively a little N. and E. of the suburb of La Villette, the wall turns S. along the eastern side of Belleville and Père-la-Chaise, and to the east and south of Bercy, above which it again reaches the right bank of the Seine. At distances, varying from one to three miles from the wall, a series of detached forts are built, one of which stands in the angle between the Seine and the Marne; five between Ivry and Issy command all the approaches on the south; the castle of Vincennes, and four forts erected among the hills that intervene between Fontenais-sous-Bois, Romainville, and the Ourcq Canal, command the approaches from the east; to the north of St.-Denis are two strong forts, one of which spans the great north road, and the other commands the Seine opposite Ile St.-Denis; on the left bank of the Seine, which to the west of the city runs parallel with the bastioned wall, and at a distance of one to two miles from it, a strong fort with bomb-proof casemates, and large barracks, are built on Mont Valérien.

The administration of the department is managed by a prefect of department and a prefect of police, which functionaries are specially charged with the police of Paris. The department is divided into 3 communal arrondissements, of which Paris, with a population of 1,053,897, is subdivided into 12 metropolitan arrondissements: the other two, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Saint-Denis .	4	37	187,513
Sceaux . . .	4	43	123,523
Total. . .	8	80	311,036

The arrondissement of Paris is almost wholly covered by the city of PARIS.

The arrondissement of St.-Denis is named from its chief town *St.-Denis*. [DENIS, ST.] *Auteuil*, a pretty village, stands at the eastern edge of the Bois-de-Boulogne, on a hill above the right bank of the Seine, and has 3667 inhabitants. *Batignolles-Monceau*, a rapidly-extending suburb on the north-west of Paris, had, in 1831, only 3428 inhabitants; it now has close upon 20,000. It stands on high ground, and is well built. *Belleville*, 5 miles from St.-Denis, was formerly a village nearly 3 miles from Paris, but it now extends to the very walls of the town, and has a population of 19,515. It stands on high ground, and is greatly resorted to by the working folks of Paris on days of recreation. This suburb has a savings' bank, a public abattoir, a theatre, and a great number of schools, and industrial establishments; the number of public gardens and wine-shops is enormous. *Boulogne*, 4 miles W. from Paris, stands between the Bois-de-Boulogne and the Seine, which is here crossed by a fine stone bridge of 12 arches leading to St.-Cloud. It is a well-built village with 6906 inhabitants. *La-Chapelle-St-Denis*, on the road from Paris to St.-Denis, and a little E. of Montmartre, is a large town with a manufacturing and trading population of 15,000. Important markets for the sale of pigs, fat cattle, milch cows, and calves, are held here. *Charonne*, 6 miles from St.-Denis, a suburb of the capital, lying to the south of Père-la-Chaise, just within the great wall of Paris, has a school of arts and trades, manufactures of ornamental paper, chemical products, and a population of 4726. *Clichy*, on the right bank of the Seine, 3 miles S.W. from St.-Denis, is an ancient village famous for the manufacture of white lead and other chemical products, glue, varnish, sheet lead, tiles, &c.; the population is 4189. *Courbevoie*, one of the best-built villages near Paris, is a station of the Paris-Versailles railroad on the left bank of the Seine, and has 6085 inhabitants, who manufacture white lead, printed calicoes, and brandy. The barracks of Courbevoie, built in the reign of Louis XV., are very large and handsome buildings. *Montmartre*, the scene of the martyrdom of St. Denis about the year 245, is 4 miles from St.-Denis. It stands on a high hill of gypsum, from which there is a view over the whole of Paris. The church, situated on the crown of the hill, is a well-preserved monument of the 12th century; it is surmounted by a telegraphic tower, which communicates with all points of the horizon. Montmartre has 7082 inhabitants, who manufacture tulle, soap, carpets, varnish, ink, and chemical products, &c. Two cemeteries are laid out on the slope of the hill. *Nanterre*, the birthplace of Ste.-Geneviève, and famous for its cakes, stands at a little distance from the Seine on the railway from Paris to St.-Germain-en-Laye, and has 2922 inhabitants. A vast number of pigs are slaughtered here for the supply of Paris. A young girl chosen from among the poor for her good conduct is yearly crowned with roses, and presented with a small dowry by the communal council. *Neuilly*, 5 miles from St.-Denis, and nearly the same distance W. from Paris, stands on the Seine, which here forms several islets, and is crossed by a fine stone bridge, the scene of some hard fighting between the French and the allied army in 1815. It is a well-built town with 9493 inhabitants, including the whole commune. In the neighbourhood of Neuilly were not long ago several royal structures,—Villiers the abode of the late Duke of Orleans; the Château de Bagatelle in the Bois de Boulogne, built by Charles X.; La-Folie-St.-James, formerly occupied by the Princess Borghese, Napoleon's sister, now converted into a lunatic asylum; and the palace of Neuilly, the usual residence of the Ex-king Louis Philippe. *Pantin*, 4 miles from St.-Denis, near the Ourcq canal, is a pretty village with 2323 inhabitants, and surrounded by gardens and country residences. *Passy*, on a hill above the right bank of the Seine, is a well-built and fashionable

suburb of Paris, with a population of 6704. It contains several famous residences, and the fashionable assembly rooms called Ranelagh; it has also two mineral springs. *Romainville*, 5 miles S.E. from St.-Denis, is a pretty village surrounded by handsome country houses, and has, including the whole commune, a population of 5046. The Château of Romainville, built on an eminence, commanding a view of Paris and St.-Denis, and surrounded by a fine park, deserves notice. *Suresnes*, 8 miles S.W. from St.-Denis, at the foot of Mont-Valérien on the left bank of the Seine, is a village with 2153 inhabitants, and proverbial for the detestable wines made in its neighbourhood. A prize of 300 francs and a crown of roses, is presented to the young woman of the commune most distinguished for her virtues, every year on the feast of Assumption. *La-Villette*, a large suburb of Paris extending outside the barrier St.-Martin, and along the Ourcq canal, is an entrepôt for wine, brandy, oil, coal, charcoal, wood, &c., and is almost wholly comprised of stores, warehouses, factories, inns, and wine-shops. It has 10,954 inhabitants, who manufacture soap, chemical products, paper, brandy, beer, ropes, rectified oil, and sugar, &c. *Montfaucon*, the metropolitan place of execution before 1789, is a dependence of La-Villette.

The arrondissement of Sceaux takes its name from *Sceaux*, a small town with a pretty church and 1900 inhabitants, pleasantly situated on the level platform of a hill in the south-west of the department. It is the seat of a tribunal of first instance, and gives name to a large cattle market, the site of which however is in the commune of Bourg-la-Reine at the foot of the hill to the left of the high road from Paris. At Sceaux formerly stood a magnificent château, which was greatly improved by the Duke du Maine, son of Louis XIV.; it was demolished at the revolution of 1789. A beautiful public garden has been formed out of a part of the park belonging to the château. *Arcueil*, a village of 2701 inhabitants, 3 miles S. from Paris, has remains of a Roman aqueduct. The fountains in the south part of Paris are fed with water from the neighbourhood, by means of an aqueduct constructed by Marie de Médicis. *Bercy*, 9 miles N.E. from Sceaux, and contiguous to the walls of Paris, is a large village on the right bank of the Seine, which is lined with quays and crossed by a fine suspension bridge. It is a great entrepôt for the wine, brandy, and oil destined for the supply of Paris, and contains a great number of large stores, sugar refineries, vinegar-works, distilleries, wood-yards, and tan-yards. The population is 7913. *Bourg-la-Reine*, a well-built village, situated in a hollow near the left bank of the Bièvre, one mile from Sceaux, has 1500 inhabitants. Condorcet committed suicide here in 1794, and is buried in the churchyard. *Charenton-le-Pont*, on the right bank of the Marne and at the confluence with the Seine, consists of two communes—*Charenton*, in which is a famous lunatic asylum, and *St.-Meurice*, which has a great foundry for steam machinery: the united population is 3393. It takes its surname of le-Pont from the bridge over the Marne, which has been the scene of many a fierce struggle recorded in the history of France. *Choisy-le-Roi*, 6 miles S. from Paris, on the left bank of the Seine, here passed on a wooden bridge, is a well-built village with 3119 inhabitants, who manufacture soap, chemical products, common clock work, marocco leather, fine pottery, and porcelain, window and stained glass, &c. Choisy is the first station from Paris on the railroad to Orléans. *Fontenais-sous-Bois*, at the north-eastern angle of the park of Vincennes, has a pretty church and 3173 inhabitants. *Gentilly*, S. of Paris in the valley of the Bièvre, is a large ancient village with 9987 inhabitants, including the whole commune. In this commune is the vast lunatic asylum of *Bicêtre*, formerly used also as a prison; the pitiless massacre of its inmates in 1792 forms a horrid episode in the history of the revolution. The walls of Bicêtre are greatly admired for their architectural decoration. *Grenelle*, a large village with a manufacturing population of 4129, situated in the wide plain on the left bank of the Seine, and S.W. of Paris, has a handsome church and a theatre. *Issy*, a village on a hill above the left bank of the Seine, has a secondary ecclesiastical school and 2629 inhabitants. *Ivry*, 5 miles N.E. from Sceaux, built on the slope of a hill near the left bank of the Seine, has a population of 6886, including the whole commune. It has manufactures of glue, room-paper, printer's ink, point lace, chemical products, &c. The vast wine stores cut in the solid rock deserve notice. *Maisons-Alfort*, situated in the angle between the Marne and the Seine, and celebrated for its veterinary college founded by Bourgelat in 1766, has a population of 1900. *Montreuil-sous-Bois*, a mile and a half N. of Vincennes, is a handsome village with a large church dating from the 12th century. It has a population of 5337, who are mostly engaged in cultivating fruit gardens, great numbers of which, inclosed and divided into small plots by walls, surround the town. Peaches, strawberries, cherries, flowers, and vegetables of all kinds are grown at Montreuil. Large quarries of gypsum are worked here. *Montrouge*, a southern suburb of Paris on the Orleans road, has a population of 7813. Here are the three entrances to the vast catacombs and quarries which extend under a considerable part of Paris. *Vaugirard*, a large well-built village contiguous to Paris on the south-west, and 4 miles N. from Sceaux, has a population of 12,978, a botanical garden, several country-houses, and a vast number of wine shops, whither the Parisian work-folk resort in great numbers on Sundays and holidays. *Vauves* or *Vanves*, a station on the Paris-Versailles railroad along the left bank of the Seine, has a population of 2506. *Vincennes*, 2 miles E. from Paris, is a well-built town with 5709 inhabitants. The walled park of Vincennes is intersected by a great number of fine avenues much frequented in fine weather by the Parisians. But the most attractive object here is a castle formerly the residence of French kings with its vast girding walls, wide ditches, square towers, and massive keep often used as a state prison. This castle, which is a fortress of the first class, contains vast stores of

arms and ammunition, a beautiful chapel founded in 1379, and a school of artillery. *Vitry*, on the slope of a hill on the left bank of the Seine, one mile E. of *Villejuif*, is nearly surrounded by nurseries and market gardens, and has 2506 inhabitants.

The department forms the see of the archbishop of Paris; it is within the jurisdiction of the High Court and University Academy of Paris; and is included in the 1st Military Division of which Paris is head-quarters. Under the late monarchy it returned 14 members to the Chamber of Deputies; it now has 28 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850; *Annuaire du Commerce*, Paris, 1850.)

SEINE-INFÉRIEURE, a department in France, formed out of several districts belonging to Haute-Normandie, and so named from comprising the lower part of the basin of the Seine, is bounded N. and W. by the English Channel, S. by the embouchure of the Seine and the department of Eure, and E. by the departments of Oise and Somme. It extends from 49° 17′ to 50° 4′ N. lat., and from 0° 5′ to 1° 45′ E. long.; its greatest length from E. to W. is 76 miles, from N. to S. 45 miles. The area is 2327.94 square miles, and the population in 1846 was 758,852; which gives 325.975 to the square mile, being 152.225 above the average per square mile for the whole of France.

The coast presents for a length of 74 miles, from Tréport to Cape la-Hève (on which there are two lighthouses), a wall of chalk cliffs, varying in height from 160 to 780 feet, and broken only by a few rivers, the mouths of which form small harbours. The surface of the department consists of two inclined plains, which intersect in a line of low hills crossing the department from east to west, and slope, one northwards to the English Channel, the other southwards to the water-line of the Seine. These plains however present considerable inequalities of surface, especially those parts of them that form the arrondissements of Rouen, Neufchatel, and Dieppe.

The principal river is the Seine, which receives several small feeders from the right bank. The chief of these are the Lézarde and the Bolbec, which flow past Harfleur and Lillebonne respectively; the Austreberte, at the mouth of which is Caudebec; the Cailly; the Robec and the Aubette, which drain part of Rouen; the Andelle, which joins the Seine in the department of Eure; and the Epte, which forms part of the eastern boundary. Of the rivers that drain the northern plain, and throw their waters directly into the sea, the principal proceeding from E. to W. are—the Bresle, which separates this department from that of Somme; the Yères; the Arques, which receives the Bethune and the Aulne; the Scie, the Saane, and the Durdent. All these rivers have a direction to N.N.W., and drain small basins separated from each other by gentle elevations.

The arrondissement of Havre, formed out of the old district of Caux, is tolerably level; it has a good and well-cultivated soil, but is generally ill supplied with fresh water. The arrondissement of Yvetot, including a small territory on the left bank of the Seine, and extending northwards to the sea, has a rich deep soil; it is also pretty level, well adapted for tillage, and contains some fine grass land. The arrondissement of Dieppe, consisting of hill and dale, has a great variety of soil, and is distinguished for the growth of hemp. The arrondissement of Neufchâtel has a very uneven surface; it contains much woodland, and some barren wastes: here agriculture is but little attended to, except in the valleys; the chief occupation is cattle-feeding, and the making of butter and cheese. The arrondissement of Rouen is also very uneven; but the soil is in general good, and the surface presents a pretty picture of fertile fields, forests, picturesque valleys, and hills with well-cultivated slopes, and summits crowned with clumps of trees. The climate of the department resembles that of Sussex, but it is somewhat colder, more moist, and the winters are longer.

The department is traversed by 13 national, 28 departmental, and a great number of parish roads; railroads connect Havre and Dieppe with Rouen, the line between which and Paris traverses the southern angle of the department.

Wheat, oats, and other corn are extensively grown, but not in quantity sufficient for the consumption. Hemp and flax are grown, especially along the coast between Fécamp and Havre; the hemp is almost exclusively used for making ropes and fishing-nets. There are fine productive meadows along the Seine; oleaginous seeds, peas, beans, vetches, tares, turnips, and potatoes are raised in abundance. The department is remarkable for the vast number of its apple and pear trees, which line the roads, surround the fields, and shelter all the villages and farm-houses in the country. Common garden fruits are abundant; but there are no vineyards, although a few centuries ago there were many. Great attention is paid to the rearing of horses, fat cattle, milk cows, and to the making of butter and cheese, both important articles of export. Sheep are numerous and of good breed; those fed on the downs near the coast, supply the mutton named, from the nature of the pasture, *mouton de Pré Salé*, which has a very high repute at Dieppe. The Seine is valuable to fishermen for its abundance of salmon, sturgeon, sole, eels, &c. Large fleets of barks of 30 to 90 tons, and with crews varying from 15 to 30 in number, are employed in the mackerel, oyster, and herring fisheries.

The minerals comprise marble, building and paving stone, chalk, flint, brickearth, potters' clay, sand used in glass factories, and marl. Iron mines were formerly worked near Forges. Peat is found. St.-Catherine's Hill near Rouen abounds in fossils.

The department is famous for its industrial energy, which is exerted upon the spinning, dyeing, and weaving of cotton, wool, and flax; the manufacture of ginghams, cotton cloths, and calicos of all kinds, broadcloth, flannel, serge, linen, and mixed cloths of wool and cotton. The cotton manufactures had a great development previous to the revolution of 1848; since then it

is said they have received some check: hand-loom weaving is carried on in almost every hamlet and cottage, and frequently on a pressure of orders the raw material is sent into the neighbouring department to be worked up. The department is famous for its bleach-works, which are conducted on the most modern principles, and turn out linen of a purer whiteness than those bleached in any other part of France. The linen woven about Fécamp is of the best quality. Cotton printing has had a great extension during the last thirty years. Among the other manufactured products may be mentioned lace, watch and clock movements, articles of ivory, pottery, window glass, bricks, &c. There are also numerous sugar refineries, silk-mills, manufactories of chemical products, metal foundries, tan-yards, ship-building yards, and other establishments more distinctly specified in the notice of the towns mentioned in a subsequent part of this article.

The commerce carried on with the interior of France, with its colonies, with the whole of Europe, the West Indies, and America, is most extensive, and includes almost every article of French import and export. Of the manufacturing industry and important commerce of the department more detailed information is given under the articles HAVRE, ROUEN, and DIEPPE.

The department of Seine-Inférieure presents an aspect very different from most other parts of France. The rural population is more scattered upon the land; farmers are in general well to do; their quaint but comfortable-looking houses are erected on the farms, sheltered by clumps of trees, and surrounded by orchards and gardens; the fields are mostly enclosed by hedgerows; the châteaus or great mansions are approached by long shady avenues of venerable trees; the hamlets, which are very numerous, consist mostly of the church and a few houses irregularly grouped about it, inhabited by the parish priest, small retailers, labourers, the shoeing-smith, the innkeeper, and the schoolmaster; everywhere the same fondness for planting trees, very generally the cider-apple tree, prevails, so that the country has some resemblance to a forest, and before entering a village or hamlet, the traveller seldom sees anything of it except the church spire shooting up above the trees. The number of rooks in this country is immense. The costume of the women varies considerably in the different districts; it is in many instances very picturesque; the linen lace-edged cap, of lofty dimensions and irreproachable whiteness, is the most remarkable article of their dress.

The surface measures 1,489,882 acres, which are distributed among 134,043 proprietors, and into 836,639 parcels. Of this area, 934,132 acres are arable land; 69,251 are grass and meadow land; 160,123 are covered with forests; 151,167 are laid out in orchards, nurseries, and gardens; 45,153 acres consist of heath and moor; 13,715 are covered with rivers, canals, ponds, and other waters; 50,472 acres are unproductive wastes; 42,627 acres are occupied by roads, streets, squares, and houses; and 1819 by cemeteries, churches, and other public buildings.

The department is divided into 5 arrondissements, which, with their sub-divisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Rouen . .	15	156	256,530
Dieppe . .	8	168	112,706
Le-Havre .	9	122	163,651
Yvetot . .	10	169	141,412
Neufchâtel .	8	144	84,553
Total . .	50	759	758,852

Of the arrondissement of Rouen and of the whole department, the capital is ROUEN. *Caudebec-les-Elbeuf*, 12 miles S. from Rouen, has important cloth manufactures, woollen and cotton-yarn factories, dyehouses, and 6051 inhabitants. *Darnetal*, 2½ miles E. from Rouen, situated in a valley watered by the Robec and the Aubette, is a busy manufacturing town with 5982 inhabitants. It is surrounded by a magnificent belt of trees, which are planted on the site of the old ditches. Two large churches, the detached tower of one of which is of great antiquity and presents a splendid view from its summit, are the most remarkable buildings. The industrial products are broad cloth, flannel, blankets, calicos, cotton handkerchiefs, cotton and woollen yarn, and paper; there are also several dyehouses. ELBEUF. *Maromme*, the first station out of Rouen on the railroad to Dieppe, is situated on the Cailly, and has 3031 inhabitants engaged in the manufacture of cotton, paper, and leather. It has also bleach-works and dyehouses. Near it is *Deville*, a fine village with a population of 4061, also situated in the valley of the Cailly, which is constantly echoing with the sound of paper-mills, flour and dye-wood mills, and cotton factories. Near Maromme also is *Canteleu*, a village of 3594 inhabitants, situated on a hill which is partly covered by the forest of Roumare; but its summit is occupied by the gardens and park of the old château of Canteleu. *Barentin*, 10 miles by railway N.W. from Rouen, stands on the right bank of the Austreberte, and has 2502 inhabitants. *Pavilly*, also on the Austreberte, has a population of 2628. *Oissel*, a winter station of the old Northmen, stands on the left bank of the Seine, 8 miles S. from Rouen, on the railway to Paris, and has 3201 inhabitants. *Sotterville*, the first station out of Rouen on the railroad to Paris, has 3971 inhabitants, who manufacture linen, glue, soap, and chemical products.

The arrondissement of Dieppe is named from its chief town, DIEPPE. *Bacqueville*, 10 miles S.S.W. from Dieppe, stands on the left bank of the Vienne, and has 2720 inhabitants. *Eu*, 18 miles N.E. from Dieppe, stands on the Bresle, which divides it into two parts—the ville or city on the left bank, and the Chaussée-d'Eu on the right bank—at a distance of 2½ miles from the harbour of Tréport, and has a tribunal of first instance, a college, and 3977 inhabitants. Under the parish church, which is lighted by splendid painted-glass windows, is a crypt which contains the tombs of St. Laurence, archbishop of Dublin,

and of several counts of Eu and of Artois. In the college church, from the pulpit of which Bourdaloue preached his first sermon, are mausoleums of the Duke of Guise (Le Balafré) and his wife Catharine of Clèves. But the great attraction of Eu is the château, which the ex-King Louis-Philippe completely restored and considerably enlarged, and to which he frequently retired in the autumn. The walls, like those of the palace at Versailles, are covered with a great number of historical portraits. The gardens of the château, commanding a view of the sea and the valley of the Bresle, are beautifully laid out, and adorned with statuary. The forest of Eu is of great extent. The Queen of England visited Louis-Philippe at this château in 1843. The town is joined by a navigable canal to *Tréport*, a small seaport, with a tide harbour, lately much improved and rendered capable of admitting vessels of 300 tons, wet docks, baths, and 3091 inhabitants, who are chiefly engaged in the fisheries.

Of the arrondissement of Havre, the chief town is *Le-Havre* [HAVRE]. *Bolbec*, 18 miles by railway N.E. from Havre, is a well-built manufacturing town, situated on the slope and at the foot of a hill above the river Bolbec, and has a reformed consistorial church, a consultative chamber of manufactures, and 9251 inhabitants. The streets are wide and regular; the houses are mostly built of bricks and cut stone, but there are also several constructed partly of timber and partly of masonry, as is common in all parts of Normandie. The principal street is adorned with two fountains, surmounted by marble statues. The industrial products comprise printed cottons, calicos, handkerchiefs, woollen stuffs, lace, linen, cotton-velvet, and leather; there are also dye-houses, bleach-works, and a considerable trade in corn, horses, and cattle. *Fécamp*, a seaport town of 9500 inhabitants, 22 miles N.N.E. from Havre, at the mouth of the river Fécamp, covers two miles of a long narrow valley, shut in by two steep and barren cliffs, several hundred feet high, on one of which is a lighthouse of the first order, in 49° 56′ N. lat., 0° 22′ W. long. The harbour, which is formed by two jetties, is frequented chiefly by fishing craft, colliers, and Baltic timber vessels; a mass of water, shut in by sluices at high tide, is set free at low ebb, for the purpose of sweeping the sand and mud out of the port. The church of Notre-Dame, which belonged to the former Benedictine abbey, is a large handsome structure, in the early pointed style; it dates from the beginning of the 13th century, and has a beautifully-finished interior; the choir and Lady-chapel are adorned with some exquisite wood-carvings. The town has a tribunal of commerce, a school of hydrography, several cotton mills, sugar refineries, tan-yards, ship-building yards, and some trade in wine, brandy, oil, linen, broadcloth, &c. It is an entrepôt for colonial produce, salt, Holland gin, and tea. Vessels are fitted out for the cod, herring, and mackerel fisheries. *Ingouville* [HAVRE]. *Lillebonne*, the ancient *Julia Bona*, is situated at the foot of a steep hill, at the extremity of a wooded valley watered by the Bolbec, 19 miles E. from Havre, and has a manufacturing population of 5099. The town stands at the intersection of five Roman roads; it contains remains of a Roman theatre, and many Roman medals, lachrymatories, and sepulchral urns have been dug up in the neighbourhood. The remains of the castle of Lillebonne, or of Harcourt, as it is also called, stands on the hill above the theatre; it was the residence of William the Conqueror, and was possessed by the Harcourts previously to the revolution of 1789. Within the massive outer walls are a garden, a modern house, and a tall round tower of beautiful masonry, which is girt by a deep ditch, crossed by a drawbridge. The valley between Lillebonne and the town of Bolbec is thickly studded with cotton mills and tan-yards. *Montivilliers*, 6 miles N.N.E. from Havre, is situated in a valley watered by the Lézarde, and has 4029 inhabitants. It is entered by a gate flanked by two towers, and retains remains of thick encircling walls. The fine gothic church of Montivilliers belonged to a suppressed abbey. The Calvinists have a small chapel here. *Harfleur*, formerly a strongly-fortified town and ship harbour, at the mouth of the Lézarde, on the right bank of the Seine, enriched by manufacturing industry and commerce, the object of many a struggle between Normans, English, and French, is now a small village, with only 1611 inhabitants. The sands of the Seine have filled its harbour; above a mile of unhealthy marshes separate the town from that river; and only small craft can venture up the Lézarde at high water. Harfleur contains a church of great beauty, which was built by the English as a monument of the victory of Azincourt.

The arrondissement of Yvetot is named from its chief town *Yvetot*, which is situated in the middle of a fertile but waterless plain, 23½ miles by railway N.W. from Rouen, 31½ N.E. from Havre, and has tribunals of first instance and of commerce, a consultative chamber of manufactures, and 9083 inhabitants. The town consists chiefly of a street 2½ miles in length, formed by timber-framed slate-roofed houses. It formerly enjoyed great privileges and exemption from taxes, and was a place of considerable foreign trade. The Sires of Yvetot are styled kings in chronicles of the 15th century, it has been supposed falsely, but an edict preserved in the exchequer of Normandy, and dated 1392, qualifies them by this title. Yvetot has linen and cotton factories, and a considerable trade in corn and sheep. *Cany*, 15 miles N. by W. from Yvetot, on the left bank of the Durdent, which drives a few cotton factories and oil-mills, has 2025 inhabitants. *Caudebec*, 6 miles S. from Yvetot, is built at the foot of a wooded hill above the right bank of the Seine, and has a population of 2616, a handsome church, a commodious harbour lined with quays but little frequented by shipping. The old fortifications, which for six months baffled the skill of the great Talbot in 1419, have entirely disappeared. The English held Caudebec from 1419 to 1450. The chief industrial products are sailcloth, soap, cotton yarn, sea biscuits, &c. *Doudeville*, a village 8 miles N.W. from Yvetot, has a population of 3688. *St. Valery-en-Caux*, a small seaport town, with a

tribunal of commerce and 5370 inhabitants, is situated 18 miles N. from Yvetot. Several coasting vessels and a large fleet of fishing craft belong to the harbour, which is small, but considerably improved lately. The exports consist of agricultural produce; the imports of wine, brandy, coal, Norway timber, &c. The herring, mackerel, and cod fisheries are the mainstay of the town.

Of the arrondissement of Neufchâtel the chief town is *Neufchâtel-en-Bray*, which is situated in a hilly country near the right bank of the Bethune, 26 miles N.E. from Rouen, and has tribunals of first instance and of commerce, an agricultural society, and 3572 inhabitants, who manufacture woollen stuffs, hosiery, leather, beer, glass, &c. The town took its name from the castle built here by Henry I. of England; previously it was a mere village named *Driencourt*, but from that time it grew in importance, so much so that from 1143 to 1596, when the ramparts of the town and the outworks of the castle were demolished, it was many times besieged and stormed. Neufchâtel gives name to some good cream and other cheeses. *Aumale*, an ill-built town on the slope of a hill above the Bresle, and famous for the battle between the forces of the League under the Duke of Parma and the army of Henri IV., who was wounded in the action, and had a narrow escape for his life, is situated 12 miles E. from Neufchâtel, and has manufactures of woollen cloths, serge, and lace; a bell foundry, fulling mills, and potteries. *Forges-les-Eaux*, a village of about 1700 inhabitants, situated on a hill near the forest of Bray, 12 miles S. by E. from Neufchâtel, has iron mineral springs, and is considered a very healthy spot. Crucible-earth of the finest quality is found at this place. *Gournay*, an ancient town 24 miles S.E. from Neufchâtel, is situated in a very pretty country on the Epte, and has a tribunal of commerce and 3210 inhabitants, who manufacture linen, porcelain, leather, and glass. It is well enough built, and surrounded by handsome boulevards which occupy the site of the old fortifications. Gournay has a good butter market; it is famous for its siege and capture by Philippe-Auguste. The church of St.-Hildevert is an interesting structure, dating partly from the 12th century, partly from a much more remote period. The heart of Blanche of Castille, St. Louis's mother, was deposited in this church. *St.-Saens*, 9 miles S.W. from Neufchâtel on the road to Rouen, situated on the Arques, has 2488 inhabitants; it took its origin from a monastery founded in 675, and burnt by the English in 1450.

The department forms the see of the archbishop of Rouen; it is comprised in the jurisdiction of the High Court and University-Academy of Rouen; and is included in the 1st Military Division of which Paris is head quarters. Under the late monarchy it returned 11 members to the Chamber of Deputies, it now has 16 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850; *Annuaire du Commerce*, Paris, 1850.)

SEINE-ET-MARNE, a department of France formed out of portions of Brie and Gâtinais, divisions of the old provinces of Champagne and Ile-de-France, and named from its two principal rivers, is bounded N. by the departments of Oise and Aisne, E. by those of Marne and Aube, S. by those of Yonne and Loiret, and W. by those of Loiret and Seine-et-Oise. Its greatest length from N. to S. is 66 miles; from E. to W. 46 miles. The area is 2175.7 square miles; and the population in 1846 was 340,212, which gives 156.37 to the square mile, being 17.38 below the average per square mile for the whole of France.

The surface presents extensive plains of great fertility, crossed at intervals by ranges of low hills which shut in the basins of several small streams, feeders of the Marne or the Seine. The only exception to this general character of the surface is the arrondissement of Fontainebleau, which contains a great number of hills of very irregular shape, bare rocks, and large forests. Some of the hill-slopes are planted with vines, which yield middling ordinary wines. The great breadth of grass-land allows of large numbers of cattle and sheep being bred and fatted for the Paris markets. The plains are generally occupied with corn crops, which yield more than enough for the consumption. The department contains many large forests; the largest is the forest of Fontainebleau. The banks of the Seine and Marne, in the western part of their course towards Paris, present an almost uninterrupted succession of villages, mansions, and country houses.

The department is crossed in the south by the Seine, which receives the Yonne and the Loing, swelled by the Lunain, respectively at Montereau and Moret on the left bank; in the centre by the Yères, which flows westward into the Seine from the neighbourhood of Provins; and in the north by the Marne, and its feeders the Petit-Morin, the Ourcq, the Grand-Morin (itself fed by the Aubetin), and the Beuvronne. Of these rivers, the Seine, the Marne, the Yonne, and the Grand-Morin are navigable. The department is traversed by three navigable canals, the Canal-du-Loing, which joins the Seine and the Loire [Loiret]; the Ourcq Canal, the main object of which is to convey pure water to Paris [Seine]; and the Provins Canal (partly open, but not completed), which is to render navigable the little river Vouzie from its source in the rich corn plains of Provins to its mouth in the Seine, near the little town of Bray-sur-Seine. In the central and eastern districts there are some ponds in which vast numbers of fish are bred.

The department has abundant roadway accommodation from 10 national, 38 departmental, and 25 parish roads. It is crossed by the Paris-Dijon railway, which passes through Melun and Fontainebleau; by the branch line from Montereau to Troyes; and by the Paris-Strasbourg line, which passes through Meaux.

The climate is temperate; dry in the south, colder and damper in the north; the prevailing winds are the west, south, and south-west.

The agricultural products include wheat, rye, barley, oats, and buck-wheat, of which cereals a large surplus is exported; potatoes, peas, beans, beet-root, and all kinds of potherbs; hemp, and various kinds of fruits; and great quantities of

hay, grown along the banks of the river for the supply of the markets of the capital. The wine of the department is bad, although some of the finest grapes grown in the north of France are gathered in the neighbourhood of Fontainebleau. The forests, which cover more than one-sixth of the whole surface of the department, contain chiefly oak, beech, maple, and birch. Fruit-trees are cultivated extensively in the west of the department; in the north and east many farms are enclosed by rows of pear and cider-apple trees. In the environs of Provins roses are extensively grown. Very few horses are reared, those used for farm labour or as roadsters being generally imported from Flanders, Normandie, and Bourgogne. Milk cows are numerous; veal calves are fed for the supply of Paris; cheese, known in Paris as *fromage de Brie*, is made in considerable quantity. The department has about 800,000 sheep of superior breed; poultry is very abundant.

The quarries of Château-Landon and Nemours furnish very beautiful building stone, of which a very large quantity is raised. Other mineral products are millstone grit, paving flints, alabaster, limestone, gypsum, potters' clay, and white sand.

The industrial products include writing and printing paper, pottery and porcelain, cotton yarn and printed calicos, leather, window glass, &c. Glass globes and cylinders of the largest size are made at Bagneaux, near Nemours, and also optical and common glass; in the central prison at Melun various articles are manufactured by the prisoners. The commerce of the department is confined chiefly to agricultural produce, wool, cattle, wood, and charcoal for the supply of Paris. About 140 fairs are held in the year.

The surface contains 1,392,445 acres distributed among 173,556 proprietors, and into 2,355,695 parcels. Of this area, 908,946 acres are arable land; 82,272 are meadow and grass land; 46,882 are under vine culture; 256,835 are covered with woods and forests; 18,190 acres are occupied as gardens, nurseries, orchards, and plantations; 8,360 acres are taken up with rivers, canals, and ponds; 22,947 acres consist of barren wastes; 48,545 are under roads, streets, squares, and houses; and 467 are occupied by cemeteries, churches, and public buildings.

The department is divided into five arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Melun . . .	6	97	60,709
Fontainebleau .	7	100	76,837
Meaux . . .	7	154	94,302
Coulommiers .	4	77	54,323
Provins . . .	5	99	54,041
Total . .	29	527	340,212

Of the arrondissement of Melun, and of the whole department, MELUN is the capital. *Brie-comte-Robert*, formerly a fortified town, defended by a strong castle now in ruins, is a small place of 2665 inhabitants, 11 miles N. by W. from Melun. It was the capital of Brie-Française; and has an elegant church, which dates from the 13th century and contains several remarkable tombs. There is a good weekly corn-market in the town.

The arrondissement of Fontainebleau is named from its chief town FONTAINEBLEAU. *Château-Landon*, 17 miles S. from Fontainebleau, is an ancient town situated on the Suzain, a feeder of the Loing, and has 2236 inhabitants. The abbey of St.-Sévérin was founded here by Childebert; in 1119 Louis le Gros resided in a castle from which the town takes the first part of its name, and which was taken by the English in 1436. Under the kings of the second race, Château-Landon had a mint. The church of Notre-Dame, dedicated in 1548, contains some remarkable wood carving. Excellent building stone is quarried here, and conveyed to Paris by the Canal-du-Loing. The triumphal arch de l'Etoile in Paris is built of stone from these quarries. *Montereau*, or *Montereau-faut-Yonne*, situated at the junction of the Yonne and the Seine (both navigable and crossed by good bridges), and at the point where the Paris-Lyon Railway, through Melun and Fontainebleau, sends off a branch to Troyes, is a well-built town 12 miles E. from Fontainebleau, and has a tribunal of commerce, and 4450 inhabitants. The town stands on the site of the Roman *Condate*, mentioned in the Itinerary of Antoninus. Its position on the confines of Bourgogne and France exposed it frequently to the ravages of war. The bridge over the Seine is infamous in French history for the treacherous murder of the Duke of Bourgogne at an interview with the Dauphin, son of Charles VI., September 9, 1419. The castle, which stood on the fork between the two rivers, and was occupied by the duke's party, was forced to capitulate; but an English and Burgundian force drove the French from both the castle and the town in June, 1420. The English held Montereau till 1428, when it was taken after a long siege by Charles VII. The Austrians were defeated in a severe action at Montereau, Feb. 18, 1814, by Napoleon, who took up his quarters after the action in the château of Surville, which stands on a high hill on the right bank of the Seine. The town has some trade in corn, flour, wood, and cattle; glazed earthenware, fine pottery, and leather are manufactured. *Moret*, near the junction of the Loing canal and river with the Seine, 6 miles E. by railway from Fontainebleau, is an ancient town with 1672 inhabitants. The bridge over the Loing is in part a Roman structure. The parish church of Moret, one of the finest in the diocese of Meaux, was consecrated by St. Thomas of Canterbury in 1166, and is numbered among French historical monuments. *Nemours*, a well-built town with a population of 3547, situated in a vale shut in by rocky hills, stands 9 miles S. from Fontainebleau, between the Canal-du-Loing and the river Loing, which is crossed by a fine bridge. An old castle, flanked by four towers and built in a vast square, is the most remarkable building in the town. Nemours has vinegar-works, breweries, tan-yards, flour-mills, tile and brick-works, lime-kilns,

marble-works, nurseries; and some trade in corn, wood, iron, charcoal, &c.

The arrondissement of Meaux is named from its chief town *Meaux*, which stands in 48° 57′ 40″ N. lat., 2° 52′ 31″ E. long., 25 miles by railway E.N.E. from Paris, and has tribunals of first instance and of commerce, ecclesiastical and communal colleges, and 9000 inhabitants. The town occupies the site of the ancient *Iatinum*, afterwards called *Meldi*. The most remarkable events in its history are its eight months' siege and capture (March 2, 1421) by the English under Henry V.; the cruelties that followed the rise of French protestantism, of which it was the cradle; and the repulse of the Russians in 1814, who however in a subsequent attempt made themselves masters of the town. Meaux is built near the Ourcq Canal on the river Marne, which divides it into two unequal parts. It is pretty well but irregularly built. The gothic cathedral of St.-Étienne, consisting of a nave, transept, aisles, choir, and sanctuary, is considered a masterpiece, though externally unfinished, one tower only being completed. The cathedral was founded in the 11th century; it contains a white marble monument erected by the department to the memory of Bossuet, of whom some memorials are still preserved in the bishop's palace. The other interesting subjects at Meaux are a public library of 13,000 volumes, the town-hall, the market-house, the cavalry barracks, two hospitals, and a theatre. Calicos, cotton handkerchiefs, earthenware, glue, saltpetre, flour, leather, &c., are among the chief industrial products; there is also a considerable business carried on in corn, cheese, wool, cattle, and poultry. The corn and cheese markets of Meaux are important. The old ramparts which are planted on the banks of the Marne afford very agreeable walks. *Dammartin*, a pretty little town of about 2000 inhabitants, situated on the road from Paris to Soissons, 12 miles N.W. from Meaux, has important corn markets and sheep fairs. The collegiate church of Notre-Dame, which dates from 1480, is a remarkable building. The site of the ancient castle of Dammartin is now planted with trees, and forms a pretty public walk. *La-Ferté-sous-Jouarre*, 12 miles by railway E. from Meaux, beautifully situated on the left bank of the Marne, and on an island in that river a little above the point where it is joined by the Petit-Morin, has a population of 4105. There are famous mill-stone quarries at this town, some of the products of which are exported to England and America. Earthenware, paper, and leather are manufactured. On a hill above it is the village of *Jouarre*, with a population of 2722. *Lagny*, a station on the Paris-Strasbourg railroad, 10 miles S.W. from Meaux, is prettily situated among meadows and vine-clad hills on the left bank of the Marne, and has 2212 inhabitants.

The arrondissement of Coulommiers is named from *Coulommiers*, an ill-built town, with a tribunal of first instance, and 3658 inhabitants, 27 miles N.N.E. from Melun, on the Grand-Morin. The town is situated in a pretty country, and possesses several flour and tan mills driven by the Grand-Morin, tan-yards, and a good trade in corn, Brie cheese, melons, wool, hides, and cattle. *La-Ferté-Gaucher*, 10 miles E. from Coulommiers, also on the Grand-Morin, has 2109 inhabitants, who manufacture serge, paper, tiles, and leather. *Rosoy* or *Rozoy*, in a fertile valley on the Yères, 11 miles S. by W. from Coulommiers, is a small place of only 1513 inhabitants, shut in by turreted walls and ramparts.

Of the arrondissement of Provins the chief town *Provins* is situated on the slope and at the foot of a hill above a valley watered by the Durtein and the Vouzie, small feeders of the Seine, at a distance of 29 miles E. from Melun, and has tribunals of first instance and of commerce, a college, an agricultural society, and 6961 inhabitants. The lower part of the town has in general wide clean streets, adorned with fountains; but in the upper and more ancient part the streets are narrow and steep. The whole is surrounded by deep ditches and high thick walls flanked with towers; a boulevard shaded by trees runs round a part of the town. The most remarkable objects in the upper town are in the Grande Place, in which are the ruins of the church of St.-Thibault; the square of St.-Quiriace, which contains the elegant church of St.-Quiriace, and is planted with elms; the college buildings, formerly the palace of the counts of Brie-Champagnais; and a square tower called Tour de Cæsar, 120 feet high, now used as a prison. In the lower town, the churches of St.-Ayoul and Sainte-Croix and the cavalry barracks are the most noteworthy buildings. Provins has chalybeate springs; its chief industrial products are coarse gray woollen cloth, earthenware, and conserve of roses; the trade in corn, flour ground in mills driven by the two rivers, wool, hides, and in roses, for which the neighbourhood has been immemorially celebrated, is considerable. *Bray-sur-Seine*, 11 miles S. from Provins, on the left bank of the Seine, which is here crossed by a stone bridge of 22 arches, has a population of about 1800. *Nangis*, 14 miles W. from Provins, is a well-built market town, with a population of 2185.

The department forms the see of the bishop of Meaux; it is comprised in the jurisdiction of the High Court and University Academy of Paris; and belongs to the 1st military division of which Paris is head-quarters. Under the late monarchy it returned 5 members to the Chamber of Deputies; it now has 7 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850; *Annuaire du Commerce*, Paris, 1850.)

SEINE-ET-OISE, a department in France, formed out of several districts of the old province of Ile-de-France, and named from its two principal rivers, is bounded N. by the department of Oise, E. by that of Seine-et-Marne, S. by that of Loiret, and W. by those of Eure and Eure-et-Loir. It incloses the department of Seine. Its greatest length from N.E. to S. is 60 miles; from E. to W. 50 miles. The area is 2163.55 square miles, and the population in 1846 was 474,955; which gives 219.53 to the square mile, being 45.78 above the average per square mile for the whole of France.

The department belongs entirely to the basin of the Seine. With the exception of the arrondissement of Étampes, in the south-east of the department, the surface is undulating; the hills however, in almost all instances, have a gentle slope, and admit of cultivation to their summit. The country presents cultivated fields, large forests, several palaces and other large mansions standing in inclosed parks, numerous towns and villages, and an immense number of handsome country houses belonging to the opulent citizens of Paris.

The soil in general is not naturally very fertile; but manure is abundant and easily procured on account of the proximity of Paris, and the farming is good, so that a great surplus of agricultural produce is raised, including wheat, rye, barley, oats, vetches, lentils, and all kinds of potherbs. The breadth of pasture land is not great; but a good deal of excellent hay is made along the banks of the Seine, the Yvette, the Yères, and the Oise. Great numbers of milk cows, chiefly house-fed, are kept for the supply of Paris and Versailles with milk; veal calves are fed; sheep are numerous and of excellent breed. Market-gardening is a profitable occupation, and is carried on extensively. Filberts, walnuts, figs, peaches, apricots, grapes, apples, and other common fruits are abundantly grown. Nurseries and pleasure-gardens are numerous. About 17,000,000 gallons of poor wine are made annually. In the north-west of the department, where the vine does not flourish, apples and pears are grown for making cider and perry, the common drinks of the inhabitants of that district. The most important forests are those of St.-Germain, Rambouillet, Dourdan, Senart, and Montmorency; they contain chiefly oak, birch, and maple, with some beech, chestnut, and hazel. Fish and poultry are abundant.

The chief rivers are the Seine, the Oise, and the Marne, which last and the Ourcq Canal cross the narrow strip of the department between those of Seine-et-Marne and Seine. Several other small rivers traverse the department, which are turned to advantage in driving mills, bleaching linen, and irrigating the fields. The largest of these in the south of the department, are—the Essonne increased by the Juine; the Orge, with its tributaries the Remarde and the Yvette; and the Bièvre; all of which enter the Seine on the left bank: the Yères, which, crossing the east of the department from Seine-et-Marne, enters the Seine on the right bank, nearly opposite the mouth of the Orge: the Epte, a feeder of the Seine, which forms the north-western boundary of the department: and the Vegre, which carries some of the waters of the western districts into the Eure.

The department is traversed by 26 national and 52 departmental roads; by all the great lines of railway centering on Paris, and by the short lines which connect that capital with Versailles, Corbeil, St.-Germain, &c.

The climate is in general mild, but moist, especially in some parts of the arrondissement of Versailles, where the great ponds in which the waters of the Seine are reserved to supply the basins and hydraulic works at the palace of Versailles, frequently give rise to fogs. Rain falls on about 100 days in the year. The winter is a little longer and colder than that of Paris.

The minerals include only building stone, gypsum, limestone, paving flints, millstone-grit, chalk, marl, and potter's and porcelain clay. There are mineral springs at Montmorency and Poissy. Peat is found in the valley of Essonne.

The industrial energy of the department has been greatly developed since 1789, when the gunpowder works of Essonne (now established at Bouchet), and the porcelain and glass works of Sèvres, were the only important establishments it possessed. There are now numerous mills and factories at various points of the department, producing cotton, flaxen, silk, and woollen threads, calico, cotton and woollen hosiery, paper, chemical products, woollen cloth, soap, oil, refined sugar, porcelain, glass, saltpetre, beer, toys, crinoline, &c.; besides metal foundries, brick-works, and above 800 wind and water mills, the greater number of which are scattered over the arrondissements of Corbeil, Étampes, and Pontoise. In the prison of Poissy, various articles of jewellery, cutlery, and furniture are made by the prisoners. The commerce of the department is carried on chiefly with Paris, and consists of the agricultural and industrial products above mentioned. About 116 fairs are held in the year.

The surface measures 1,384,673 acres, which are distributed among 229,623 proprietors, and into 2,669,690 parcels. Of the whole area, 906,269 acres are arable land; 49,648 are grass and meadow land; 41,295 are under vine-culture; 280,087 under woods and forests; 22,072 acres are laid out in gardens, nurseries, and plantations; 8493 are occupied by rivers, canals, marshes, and ponds; 26,995 acres consist of heath and moor; 46,514 are under roads, streets, and houses; and 828 acres are taken up with cemeteries, churches, and public buildings.

The department is divided into 6 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Versailles . .	10	114	150,779
Mantes . . .	5	127	60,431
Rambouillet .	6	119	67,983
Corbeil . . .	4	93	60,198
Pontoise . .	7	161	94,105
Étampes . .	4	69	41,459
Total . .	36	683	474,955

Of the arrondissement of Versailles, and of the whole department, the capital is Versailles. *Argenteuil*, 12 miles N.N.E. from Versailles, is prettily situated on a hill above the right bank of the Seine, which is here crossed by a toll bridge. The neighbourhood is famous for the quantity, not the quality, of wine produced, and for the best figs grown north of Paris. Argenteuil has a population of 4377; it was the site of the convent in which Heloïse took the vows. The old fortifications were levelled in 1810, and their site now forms an agreeable walk. *St.-Germain-en-Laye*

is noticed under GERMAIN-EN-LAYE. *Meulan*, a station of the Paris-Rouen Railroad, 19 miles N. by W. from Versailles, is a small but ancient town, with about 2000 inhabitants. It stands in a pretty country, partly on the slope of a hill above the right bank of the Seine, and partly on an island, which is united to the two banks of the Seine by a long bridge. The part of the town built on the island is called the Fort, from its having been formerly fortified. *Poissy*, a first-class station on the Paris-Rouen Railroad, 10 miles N. from Versailles, stands on the left bank of the Seine, here crossed by a long bridge, and has 4000 inhabitants. It is an ill-built town, dismal looking with its old crumbling fortifications, and dirty in consequence of the continual passing of cattle and sheep, for which its market is the largest in the neighbourhood of Paris. This market was established by St. Louis, who was baptized in the church of Poissy, a remarkable structure, consisting of three naves with side chapels, and dating from the 12th century. On the site of the Ursuline convent, founded by Philippe le Bel in 1304, a prison was erected in 1818, for the convicts of the departments of Seine and Seine-et-Oise. *Rueil* or *Ruel*, 5 miles N.N.E. from Versailles, and a little W. of Mont-Valérien, is a pretty town with a handsome church, large barracks, and a population of 7284. Between it and the left bank of the Seine is the palace of Malmaison, the residence and death-place of the Empress Josephine. The empress and her daughter Hortense are buried in the church of Rueil. *Saint-Cyr* near Versailles, famous for its special military school, to which entrance is gained by passing a public examination, has about 1800 inhabitants. *Sèvres*, 5 miles E. by N. from Versailles, on the high road to Paris, is situated at the foot of a high hill on the left bank of the Seine, over which there is a handsome stone bridge. The town is famous all over Europe for its porcelain manufactures; it possesses a curious museum, in which are arranged specimens of all foreign and French porcelains; and of the clays and other ingredients which enter into their composition, together with a collection of models of the vases, ornaments, services, figures, and statues that have ever been manufactured in the town. The old quarries in the hill behind the town have been formed into vast cellars, which are said to impart a peculiar quality to wine. Coloured and enamelled pottery and glass are also made here. The town is well built, and has a very ancient church. A little N. of it is *St.-Cloud* [CLOUD, ST.], and on the hill above it is the park, palace, and town of *Meudon*. Meudon is a station on the Paris-Versailles Railway, and has 3174 inhabitants. A pretty chapel has been erected in memory of the 55 victims of the terrible railway accident which occurred May 8, 1842, between Meudon and the Bellevue station.

The arrondissement of Mantes is named from its chief town *Mantes*, a first-class station on the Paris-Rouen Railroad, 34 miles W.N.W. from Paris, on the left bank of the Seine, which an island here divides into two branches, crossed by handsome bridges, that connect the town with the suburb of *Limay*, on the right bank of the river. The town, which is well built, and adorned with several fountains, has a public library, a secondary ecclesiastical school, three hospitals, an almshouse, several tanyards, breweries, flour-mills, and a saltpetre factory. The united population of Mantes and Limay is 5678. *Houdan*, situated at the confluence of the Vesgre and the Opton, 16 miles S. from Mantes, has 2003 inhabitants. A fine gothic church, and a high massive tower, the last remnant of its old fortifications, are the most notable objects in the town.

The arrondissement of Rambouillet has for its chief town *Rambouillet*, which is situated in a fertile valley near a large forest of same name, 18 miles S.W. by railway from Versailles, and has a tribunal of first instance, an agricultural society, and 3835 inhabitants. It is well built, with wide, regular, and clean streets. The forest which is traversed in all directions by fine roads; the park; the gardens laid out by Le-Nôtre and containing a piece of water 100 acres in extent; and the old palace, surrounded by wet ditches, and flanked by five ancient towers, in one of which François I. died in 1547, form the great attractions of Rambouillet. In the park Napoleon established the first model farm in France, where he introduced from Spain a flock of merinos, in order to improve the native French sheep. Charles X., driven from Paris in 1830, retired to Rambouillet, which however he was soon compelled to leave for Cherbourg. *Chevreuse*, 10 miles N.E. from Rambouillet, is a small place of about 1800 inhabitants, built on the slope of a hill above the Yvette, the summit of which is covered with the ruins of an ancient castle. *Dourdan*, 12 miles S.E. from Rambouillet, is situated near the forest of Dourdan, in the valley of the Orge, and has 2365 inhabitants, who manufacture silk and woollen stockings, cotton yarn, and pearl buttons. The domain of Dourdan formerly belonged to the crown of France; before the revolution of 1789 it was the property of the house of Orléans. Of the ancient fortress and castle there remain the keep and 8 other towers, united by a curtain flanked with bastions, and girt by wide deep ditches. The parish church is a handsome structure, the portal front of which is surmounted by two spires, like those of the cathedral of Chartres. *Montfort-l'Amaury*, an ancient town with a population of 1800, situated on a hill 9 miles N. from Rambouillet, is remarkable for the ruins of its ancient castle, the seat of the ancestors and descendants of Simon de Montfort. The ruins, which belong to the town, have been cleared of the fallen rubbish, and planted so as to form promenades. The parish church with its fine windows, and the cemetery, deserve notice.

The arrondissement of Corbeil is named from its chief town *Corbeil*, which is situated on the left bank of the Seine, at the mouth of the Essonne, 18 miles S. by railway from Paris, and has a tribunal of first instance, and 4455 inhabitants, who manufacture cashmere shawls, printed calicos, woollen yarn, coloured pottery, plaster of Paris, flour, &c. The old parish church, large flour mills, driven by the Essonne, the corn market, and great granary, are the most remarkable objects

in Corbeil. A bridge across the Seine joins the town to *Corbeil-Vieux*, on the right bank of that river. *Arpajon*, previous to 1720 called *Châtres*, is a pretty town surrounded by fine shady promenades, situated 10 miles W. from Corbeil, at the junction of the Remarde with the Orge, and has 2234 inhabitants, who trade in corn, flour, poultry, pigs, calves, wool, and leather. Châtres was formerly fortified; Edward III. took it in 1360; on this occasion the inhabitants of the town, who had shut themselves up in the church, were burnt alive, with the exception of 300, who, escaping the flames, were cut down by the English. *Essonnes*, a village on the Seine, one mile distant from Corbeil, has 3613 inhabitants. *Longjumeau*, a pretty village of 2000 inhabitants, is situated between two hills on the Yvette, and on the high road to Orléans. *Mont-l'Héry*, an ancient well-built walled village, with 1700 inhabitants, situated between Longjumeau and Châtres, is famous in French history for its castle, founded in 1015, and one of the strongest fortresses in the kingdom. The lords of this castle, the keep of which, 108 feet high, is still standing, were for a long time the terror of the kings and the people of France. Louis-le-Gros at last got possession of the fortress and demolished a great part of it. Several kings of France resided here; St. Louis hid himself among the ruins to escape from his rebellious nobles; but the most memorable occurrence connected with Mont-l'Héry, was the bloody battle fought near it in 1465, between the French barons headed by Charles of Burgundy, and the forces of Louis XI., who was defeated. In the plain to the north of the town there are two places still called Champ-de-bataille and Cimetière-des-Bourguignons.

The arrondissement of Pontoise is named from *Pontoise*, an old well-built town, with narrow steep streets, some remains of its old castle and inclosing walls, and a population of 5419, situated on the slope of a hill at the confluence of the Viosne and the Oise, 18 miles N.N.W. from Paris by the Paris-Amiens railroad. The town, which takes its name from the bridge over the Oise, has a tribunal of first instance, a college, a public library, a large hospital, and the churches of St.-Maclou and Notre-Dame, which stand in large irregular squares. Between 20 and 30 flour mills are driven by the Viosne. The trade in corn, flour, cattle, calves, hides, plaster of Paris, and chemical products, is considerable; it is greatly facilitated by the navigation of the Oise, and by the railroad. *Beaumont*, a pretty village of 2022 inhabitants, is situated on a high hill above the right bank of the Oise, 12 miles N.E. from Pontoise. *Ecouen*, an insignificant village 14 miles E. by S. from Pontoise, is mentioned merely to mark the site of the vast old castle of the Montmorencys, and subsequently of the house of Condé; which was gutted during the first revolution, converted into a school for the orphans of officers of the Legion of Honour by Napoleon, and restored by Louis XVIII. to the family of Condé. It now forms part of the possessions of the Duke d'Aumale. *Gonesse*, situated 3 miles S.E. from Ecouen, in a rich wheat district, on the Crould, which drives several flour-mills, has a population of 2221. The territory of Gonesse was the private property of Hugues Capet, before his elevation to the throne of France. The church, a remarkable one, richly decorated in the reign of Louis XIV., dates from the 12th century. Philippe-Auguste was born at Gonesse. *Isle-Adam*, a station on the Paris-Amiens railway, 7 miles N.E. from Pontoise, on the left bank of the Oise, which here forms an island, has a population of 1700. Of the fine palace of the Princess of Conti, built in the island, there are still some imposing remains, but the best part of the structure was demolished at the first revolution. *Montmorency* or *Enghien*, 10 miles by railway S.E. from Pontoise, is an ancient village, with 2051 inhabitants, situated on a hill which commands a fine view over the pretty valley and forest of Montmorency. At one end of the town is the house called l'Hermitage, in which Jean Jacques Rousseau lived with Therèse le Vasseur, and in which Grétry died, in 1813. Montmorency gave the title of baron and, after 1551, of duke, to the ancient and illustrious family of Burchard; the last duke, Henri II., having been beheaded by Louis XIII. in 1632, the estates were confiscated, and re-granted to the prince of Condé, husband of Henri's sister; and Louis XIV., in the patent confirming this grant, changed the name of Montmorency to Enghien; the first revolutionists called it *Emile;* at the Restoration, the name Enghien was again imposed by Louis XVIII.; but in spite of all these changes, the name of Montmorency has at all times prevailed. In the valley of Montmorency, near the pond of St.-Gratien, there are sulphurous springs and baths. The neighbourhood abounds in pretty walks, which are much frequented by the Parisians.

Of the arrondissement of Étampes, the chief town, *Etampes*, is situated 34 miles S. from Paris on the railroad to Orleans, in a pretty valley watered by two feeders of the Juine, and has a tribunal of first instance, a college, an agricultural society, and a population of 8157. It is well enough built, well laid out, and surrounded by public walks shaded by fine trees. Of the old castle built by king Robert about 1030, and demolished by Henri IV., there remains only a single tower, called Guinette. The churches of Notre-Dame, St.-Basile, St.-Gilles, and St.-Martin, which are remarkable for their antiquity; the town-hall, an ancient turreted structure; and the granary recently erected, are the most important public buildings. The town has an important trade in wool and corn, brought from the districts of Beauce and Gâtinais, for the supply of the capital; a great number of flour-mills are driven by the Juine and its feeders. Woollen and cotton hosiery, and leather, are manufactured; paving granite is quarried in the neighbourhood. *Méréville*, higher up the Juine, 9 miles S. from Étampes, has 1900 inhabitants; close to it is a splendid mansion and park. *Milly*, E. of Étampes, on a feeder of the Essonne, is an ancient village, with a spacious corn-market, hospital, and 2023 inhabitants.

The department forms the see of the bishop of

Versailles; it is included in the jurisdiction of the High Court and University Academy of Paris; and is included in the 1st Military Division, of which Paris is head quarters. Under the late monarchy it returned 7 members to the Chamber of Deputies; it now has 10 representatives in the Legislative Assembly of the republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850; *Annuaire du Commerce*, Paris, 1850.)

SEISIN is a term properly applied to estates of freehold only, so that a man is said to be *seised* of an estate of inheritance or for life, and to be *possessed* of a chattel interest, such as a term of years. This distinction does not appear to have existed in the time of Bracton; at least he uses the two words as identical in meaning 'possessio sive seisina multiplex est' (lib. ii., folio 38).

The seisin of the tenant of a freehold is the legal possession of the land. It is actual seisin, called seisin in deed, when he has corporeal possession of the land. It is seisin in law when lands have descended to a person, but he has not yet actually entered into possession of them, and no person has usurped the possession. When an estate of inheritance is divided into several estates, as for instance an estate for life, and a remainder or reversion in fee, the tenant in possession has the actual seisin of the lands; but the persons in remainder or reversion have also seisin of their respective estates.

In the conveyance of land by feoffment, the delivery of the possession, or livery of seisin, as it is termed, is the efficient part of the conveyance. [FEOFFMENT.]

The word seisin is also applied to the services due from the tenant to the lord. When the lord has received the tenant's oath of fealty, he has obtained seisin of all his services.

Seisin in deed is obtained by actually entering into lands; by the receipt of rents or profits; and by the actual entry of a lessee to whom the lands are demised by a person who is entitled to but has not obtained actual possession.

Seisin may also be acquired under the Statute of Uses, 27 Hen. VIII., which enacts that when any person shall be seised of any lands to the use, &c., of another, by reason of any bargain, sale, feoffment, &c., the person having the use, &c., shall thenceforth have the lawful seisin, &c., of the lands in the same quality, manner, and form as he had before in the use.

A disseisin supposes a prior seisin in another, and a seisin by the disseisor which terminates such prior seisin. The doctrine of disseisin is in many respects very obscure, and at present of little practical importance.

SEISTAN, called also *Segestan*, is a province, or rather a country, situated in the eastern part of the table-land of Iran, and enclosed within the boundaries of the kingdom of Afghanistan. Taken in its most comprehensive signification, Seistan comprehends the countries between 30° and 32° 30′ N. lat., and between 61° and 65° E. long.; but many writers limit the name of Seistan to a smaller portion of country. On the north of Seistan is the extensive mountain-region known to the ancients under the name of Paropamisus, and called by modern geographers the Mountains of Hazaureh and Eimack; on the east is the Plain of Kandahar; on the south is the Desert of Beloochistan; and on the west is a lofty chain of hills, which divides the eastern and smaller plains of Iran from the more extensive deserts which lie west of it.

The Plain of Seistan, with the adjacent valleys and the Plain of Kandahar and its dependencies, is included in a closed basin. Not a drop of water which descends on it ever reaches the sea; and this constitutes its peculiar character. The surface sinks from the south and the north, and the lowest part of it is indicated by the course of the river Helmund, from Killah Beest to its entrance into the Lake of Seistan. The southern part of the plain is a desert, with the exception of a few spots slightly fertile. In a few places the soil is impregnated with salt. No permanent river drains this desert; and the Helmund, which runs along its northern boundary, does not receive any supply from the north, not even during the rains: but wells and tanks are met with at distances not exceeding 24 miles. The country is inhabited by some tribes of Beloochees, who wander about with their herds. The country on the north of the Helmund is nearly as much a desert as the southern. There are permanent villages among the cultivated lands, but by far the greater part of the inhabitants are scattered over the face of the country in tents. The river valleys are however fertile.

The Lake of Seistan, or the Hamoon, extends (between 61° and 62° E. long. and 31° and 32° N. lat.) about 70 miles from S.S.W. to N.N.E., and has an average breadth of 18 miles. It has rarely a depth of more than from three to four feet, and is almost entirely covered with reeds and rushes. All the rivers which originate on the southern and western slope of the mountains that surround the Plain of Seistan on the north and east, fall into the Hamoon. They partake of the nature of mountain torrents, at one time of the year rushing down with great violence, almost black with mud, and at others being either quite dry, or flowing in a clear, languid, and shallow stream. The largest of these rivers are the Helmund, the Khash-rood, the Furrah-rood, and the Adrascund.

Little is known of the climate of Seistan. The heat in summer is more oppressive than at Kandahar. For nearly half the year a strong steady wind blows from the snowy mountains which lie to the north. During the prevalence of this wind the days are very hot, but the nights are generally cold. It affects the eyes of the inhabitants, particularly by the dust which it raises, and which is mixed with particles of salt. During the three months of the winter the weather is very pleasant, and similar to that in the north-west part of Hindustan.

The vegetable productions, in the few cultivated spots, include wheat, rice, and some coarser grains, cotton, tobacco, water-melons, pomegranates, tamarisks, and mulberry trees. There are but few horses in the country. Camels, sheep, goats, mules, asses, and cattle, are numerous, and constitute the chief

wealth of the inhabitants. The more common wild animals are wolves, jackals, hyenas, porcupines, and hedgehogs. The skins of otters are exported to Bokhara, where they fetch a high price. Water-fowl in the rivers, and flies and mosquitoes are very numerous. Common salt is abundant.

The country north of the Helmund and the district of Gurmsir are inhabited by tribes of the Dóoranees, but in some parts of the desert Beloochees have settled. Elphinstone states that the original inhabitants of Seistan Proper are Tanjiks; but besides these there are Shekrukees, the Surbundees, and the Nahrooees. There are supposed to be several towns of some importance, but of these little is known.

Seistan, as a province of the kingdom of Afghanistan, is governed by a haukim, who collects the revenue and commands the militia, and a sirdar, who commands the regular troops. It was visited by Forster in 1788, by Christie in 1810, and by Conolly in 1839. To the narratives of those travellers, and to Elphinstone's 'Caubul,' we refer for further information.

SEISURA, the name assigned by Mr. Vigors and Dr. Horsfield to a genus of birds belonging to the family MUSCICAPIDÆ. Locality, Australia.

SEJA'NUS, LU'CIUS AE'LIUS, a native of Vulsinii, in Etruria, was the son of Seius Strabo, a Roman knight. He first attached himself to Caius Cæsar, the grandson of Augustus, but afterwards gained the favour of Tiberius, who shortly after his accession to the imperial power appointed him to the command of the Prætorian troops, in conjunction with his father. His influence increased till the whole administration of the state was committed to him. Tiberius sent him with his son Drusus, in order to suppress the insurrection of the legions in Pannonia; and when his father, Seius Strabo, received the government of Egypt, Sejanus obtained the sole command of the Prætorian troops. These troops, which had previously been quartered in different parts of the city, he collected into one camp, and used every effort to gain over to his interests. He also secured the support of the leading members of the senate. To remove Drusus, the son of Tiberius, out of the way, he seduced his wife Livia, who was then prevailed upon to consent to her husband being poisoned. (Tacit., 'Ann.,' iv. 3, 8; Dion Cass., lvii. 22; Suet., 'Tib.,' 62.) Sejanus was anxious to marry the widow of Drusus, but Tiberius would not consent. Fearing that Tiberius should suspect his designs, he persuaded the emperor, who was fond of ease, to retire from the city. Tiberius withdrew to Campania, and then to the island of Cápreæ. Sejanus, now released from any restraint, acted in the most arbitrary manner. He procured the death of Agrippina, the widow of Germanicus, and also of her two sons Nero and Drusus. But the suspicions of Tiberius became aroused, and he resolved upon the death of his favourite. At a meeting of the senate, which Sejanus was induced to attend, he was arrested by Nervius Sertorius Macro, and was the same day condemned to death. (A.D. 31.) His body was exposed to the fury of the people, and his children and many of his relations and friends were also put to death. (Dion Cass., lviii. 6–19; Tacit., 'Ann.,' v. 6, &c.; Suet., 'Tib.,' 65.)

SELAGINA'CEÆ, a small natural order of monopetalous Exogens, belonging to Lindley's Nucamentose group. The order contains six genera, all of which are natives of the Cape of Good Hope. They are herbaceous plants or small shrubs, with alternate leaves, sessile spiked flowers, and large bracts. Their properties are unknown.

SELBY. [YORKSHIRE.]

SELDEN, JOHN, was born Dec. 16, 1584, at Salvington, near Worthing in Sussex. Selden began his education at the free grammar-school at Chichester, and at the age of fourteen entered at Hart Hall, in Oxford, a foundation since merged in the present Magdalen Hall in that University. When about nineteen he was admitted a member of Clifford's Inn, and in 1604 removed to the Inner Temple. He devoted this part of his life to the study of history and antiquities, both civil and legal, to the acquirement of languages, and the study of logic and of moral philosophy. At twenty-two years of age, he wrote his first published treatise, the 'Analecton Anglo-Britannicon,' a work which gave him an immediate reputation. This was followed by other works, and in 1614 appeared his treatise upon 'Titles of Honour,' a book then and ever since regarded as one of authority. In 1618 he was summoned before the High Commission Court for publishing the 'History of Tithes,' wherein he allows the legal but denies the divine right of the clergy to the receiving of tithes. Selden apologised for the publication, though he did not recant his opinions.

He first appeared in the House of Commons as member for Lancaster, in 1623, the last parliament of James I.; and in 1625, on the accession of Charles I., in the parliament which assembled at Oxford, he sat for Great Bedwyn.

Charles soon summoned a second parliament on the speedy dissolution of the first, and Selden was again returned for Bedwyn. He was one of the members appointed to prepare the articles of impeachment against the Duke of Buckingham, and was also named a manager of the prosecution. Another dissolution in 1626 stopped the proceedings against the Duke, but a forced loan which Charles attempted, called Selden, though not in the habit of appearing at the bar, to defend in the Court of King's Bench Sir Edward Hampden, who had by warrant of the council been imprisoned with four others for refusing to pay his portion of the loan. Selden and his fellow-counsel were unsuccessful in their endeavours to obtain the discharge of the prisoners. In Charles's third parliament, which met in 1628, Selden was returned member for Ludgershall; and, on the proceedings against the Duke of Buckingham being renewed, he demanded that judgment should be given against the Duke upon the impeachment of the former parliament. He took an active part in the discussions which now occupied the House of Commons on the levying of tonnage and poundage, and in the drawing up of the Petition of Rights, to which Charles gave his consent in 1628.

During this recess Selden devoted himself to literary pursuits. At the request of Sir Robert Cotton, he transcribed the Greek inscriptions in the collection of ancient marbles which the Earl of Arundel had received from the East, and they were published by the name of 'Marmora Arundeliana.' [ARUNDEL MARBLES.]

Parliament re-assembled in January, 1629; but it was soon dissolved by the king in consequence of the remonstrance of the commons against the levying of tonnage and poundage. Selden and some others were committed to the Tower for their part in this affair. He was offered his discharge if he would give security for his good behaviour, which he refused to do. He was accordingly still imprisoned, but in the King's Bench, and his confinement was less rigorous. In 1634 he gave bail and was allowed to go at large; and at last he obtained his entire liberation by a petition to the king and the interest of Laud. Soon after he appears to have approached the court party, and to have gained even the favour of Charles, to whom he dedicated the treatise, 'Mare Clausum.'

In the great case of ship-money we find no mention of Selden. In the Long Parliament, which assembled in 1640, he was returned a member by the University of Oxford. He sat on the committees of the lower house, which undertook the proceedings against Strafford. Though the friend of Laud, by whom he was desired to write many of his works, he was nominated by the House to frame the articles of impeachment against the archbishop. He made no opposition to the resolutions which ultimately caused the exclusion of the bishops from the House of Peers. But he afterwards agreed to a protestation that the House of Commons should maintain the Protestant religion according to the doctrines of the English church, and defend the authority, privileges, and person of the king. The court continued to regard him as their friend, until the quarrel of the king with his Commons arose about the militia, when Selden spoke against the commission of array which Charles had been driven to resort to on being deprived of all authority over his own army.

Throughout his whole life Selden was devoted to retirement and to literary pursuits, and it is not easy to decide to which party he most inclined; it is probable that he was respected by the king, who knew his honesty. His last public acts of any importance were the discussions in which he took part in the Assembly of Divines at Westminster. In 1643 he took the covenant; and in the same year the parliament made him keeper of the rolls and records in the Tower. Selden had great influence in the House of Commons. He procured the restitution of the endowment of the Arabic professorship in Oxford, which had been seized on the attainder of Laud, by whom it was founded; and he succeeded in preserving the library of Archbishop Usher from dispersion. He remained in parliament after the execution of the king; but he withdrew from public affairs as much as possible, and, though requested by Cromwell, declined to write an answer to the 'Eikon Basilike.' Selden died Nov. 30, 1654, in London, at the house in the White Friars of Elizabeth, countess dowager of Kent, whose estates he had latterly managed. He had lived with the countess for some time, and it was reported that he had been married to her. He was buried in the Temple Church, where a monument was erected to him. He bequeathed his very valuable collection of books to his executors, of whom one was Sir Matthew Hale, to be placed in some convenient library or college. Hale and his co-executors sent the books, about 8000 volumes, to Oxford, where a noble room was allotted for their reception.

Selden was a diligent student, and his literary labours only ended with his life. In the treatise entitled 'Mare Clausum,' published in 1635, he maintains the right of England to exclude the fishermen of Holland from the seas which she asserted to be her own, in answer to the treatise of Grotius, entitled 'Mare Liberum,' which denied the right. In 1640 appeared his great work, 'De Jure Naturali et Gentium, juxta Disciplinam Ebræorum,' or on the Law of Nature and Nations, according to the practice of the Hebrews. He published also 'A Brief Discourse concerning the Power of Peers and Commons;' 'Privileges of the Baronage of England;' an edition of the 'Origines' of Eutychius; 'De Anno Civili et Calendario Judaico,' &c.

Selden's 'Dissertation on Fleta,' which, like most of his other works, is written in Latin, shows him to have been a learned lawyer. He wrote Latin well, but this was at a time when such an accomplishment was not uncommon. There is a book of 'Table Talk' by him, which contains much good matter aptly expressed. It was compiled by his amanuensis Richard Milward, and published in 1689. Whitelocke, his biographer, Wilkins, Baxter, and Clarendon, all bear testimony to the excellence of his character and his learning. Clarendon, who was his intimate friend, says, 'Mr. Selden was a person whom no character can flatter or transmit in any expressions equal to his merit and virtue.'

SELE'NE, the Moon, was worshipped by the Greeks. In course of time some of the attributes of Selene were given to Artemis, who was represented as the goddess of the moon; but these deities were originally distinct. [ARTEMIS.]

SELENITE. [CALCIUM.]

SELE'NIUM, a non-metallic, solid, elementary body, discovered in 1818 by Berzelius in iron pyrites.

Selenium has a metallic lustre, and the appearance of lead when in mass; when reduced to powder it is of a deep brown colour. It is inodorous, moderately hard, may be readily scratched with a knife, is brittle as glass, and easily reduced to powder. Its fracture is conchoidal, and perfectly metallic. Its specific gravity varies from 4·30 to 4·32, on account of the cavities which it frequently contains. It is a bad conductor of heat, and a nonconductor of electricity. It softens at 212°, and may be drawn out into fine threads, which are transparent, and of a red colour by transmitted light. When heated above 212° it

becomes fluid, and boils at 650°. Selenium is soluble in hot oils and melted wax.

Oxygen and *Selenium* combine in three different proportions. Oxide of Selenium ($Sel^1 O^1$) is gaseous, colourless, slightly soluble in water, and quite devoid of acid properties. Selenious Acid ($Sel^1 O^2$) is colourless, and when strongly heated sublimes; it attracts moisture from the air, and is consequently very soluble in water; it forms salts with bases, which are called *Selenites*. Selenic Acid ($Sel^1 O^3$) is liquid, colourless, inodorous, of an oleaginous consistence, and very caustic; it may be heated to 536° without decomposition; its salts are called *Seleniates*. *Hydrogen* and *Selenium* unite to form Seleniuretted Hydrogen ($Sel^1 H^1$). This gas is colourless, has a disagreeable odour, and so powerfully irritates the membrane lining the nose as to excite symptoms of catarrh and destroy the sense of smelling for some hours. When exposed to the atmosphere it is decomposed, its hydrogen being absorbed by oxygen, and the selenium is deposited. *Chlorine* and *Selenium* combine to form a chloride ($Sel^1 Chl^2$), which is a brown liquid, heavier than water. There is also a ter-chloride ($Sel^1 Chl^3$), a white solid, decomposable by water. *Sulphur* and *Phosphorus* also combine with selenium; and selenium forms Seleniurets with most of the metals.

The characteristic properties of selenium are those of tinging the flame of the blowpipe of a light blue colour, and emitting an acrid vapour, when heated in the air, which has the peculiar smell of horse-raddish.

SELEUCEIA (Σελεύκεια), a town of Assyria, on the western bank of the Tigris, and a few miles to the south of the modern Bagdad, was built by Seleucus Nicátor. It became, at the expense of Babylon, the most important city in the East, but declined in population after the foundation of Ctesiphon by the Parthians, on the eastern bank of the Tigris. It contained, in the time of Pliny, 600,000 inhabitants. It was burnt by the Romans in the expedition of Trajan into the East, and again by Lucius Verus, the colleague of Aurelius, at which time it contained 500,000 inhabitants. It was also taken by Septimus Severus, from which time it seems to have been almost abandoned by its inhabitants.

Rich, who visited the ruins of Seleuceia in 1812, says that they are directly opposite those of Ctesiphon, and not to the north of the latter, as is generally stated. A great part of the western wall is destroyed; but the northern and the southern walls still remain. In the area are some heaps of ruins; but the greatest quantity are outside the limits of the enclosure to the westward, where they extended to a very great distance.

There were several other cities called Seleuceia, one of which was about five miles north of the mouth of the river Orontes in Syria. The remains of this Seleuceia are at a place now called Souadieh.

SELEU'CIDÆ, a Greek dynasty in Asia, founded, after the death of Alexander the Great, by Seleucus, the son of Antiochus. On the division of the empire at the death of Alexander, Seleucus was entrusted with the command of the body of cavalry called the Companions, and the satrapy of Babylon was bestowed upon him in the new partition, after the death of Perdiccas (321 B.C.). In the war which followed, he took the part of Antigonus against Eúmenes. After the death of Eúmenes (315 B.C.), he received Antigonus into his territory with great appearance of friendship; but taking offence at the tone of superiority which his guest assumed, and dreading his power, he fled to Egypt, and joined Ptolemæus Soter, Lysimachus, and Cassander, in a league against him.

The defeat of Demetrius at the battle of Gaza enabled Seleucus to recover Babylon. From this period, 312 B.C., commences the æra of the Seleucidæ. Shortly afterwards he obtained possession of Media. After the sea-fight, 306 B.C., in which Demetrius defeated Ptolemæus, Seleucus assumed the diadem and the title of king. Extending his dominions partly by force and partly by conciliation, he conquered Bactria; and made an expedition against Sandrocottus, an Indian king, with whom he formed an alliance. He returned with a large army to the war with Antigonus, which was concluded by the battle of Ipsus, 301 B.C. In the division of territory which followed, Seleucus obtained Syria and the inland part of Phrygia, and he soon acquired Cappadocia, Seleucis, and, according to Appian, all the provinces conquered by Alexander between Phrygia and the Indus. He planted many cities, the most celebrated of which were Antiocheia in Syria and Seleuceia on the Tigris. Seleucus took in marriage Stratoníce, the daughter of Demetrius Poliorcétes; but he soon engaged in a war with him, which was terminated in the defeat of Demetrius, who was taken prisoner, 286 B.C., and died after three years' captivity. Before this marriage, Seleucus, by a former wife, Ápama, had had a son Antiochus, who conceived a strong passion for his mother-in-law Stratonice, to gratify which Seleucus resigned her, making over to him at the same time the majority of the seventy-two satrapies comprised in his empire, and reserving for himself those only to the west of the Euphrates. At the close of his reign, he made war upon Lysimachus, and, upon his defeat and death, conceived the design of conquering Macedonia. Passing over to Europe for this purpose, he was treacherously killed by Ptolemæus Ceraunus, whom he had received with great kindness on his flight from Egypt. This was B.C. 280, in his eighty-second year. The character of Seleucus is much praised by ancient historians. His military talents are generally admitted, and he was not deficient in the virtues of civilisation. He possessed great personal strength and courage.

This vigorous founder of a dynasty of kings had twenty-one successors, among whom were four of the name of Seleucus. The others who were most conspicuous in history were the Antiochi [ANTIOCHUS]. Antiochus Asiaticus, the twenty-second king of this dynasty, who was expelled by Cn. Pompeius Magnus, B.C. 65, was the last.

The coins of this dynasty are very numerous. The scattered history of the Seleucidæ has been collected from Justin, Appian, Diodórus, Polybius,

and others, by the authors of the 'Universal History.' The following works may also be consulted:—Vaillant, 'Historia Seleucidarum;' Fröhlich, 'Annales Regum Syriæ;' Clinton, 'Fasti Hellenici;' and Droysen, 'Geschichte der Nachfolger Alexanders.'

SELEUCUS. [SELEUCIDÆ.]

SELIM I., Emperor of the Turks, was the son of Bayezid or Bajazet II. He was born under the reign of his grandfather Mohammed II., in 1467. Being governor of Trebizonde in 1511, he revolted against his father, and marched to Constantinople. Though defeated, the janissaries and the spáhis being in his favour, his father Bajazet was compelled to resign, and he was accordingly proclaimed emperor May 23, 1512. His first step after his accession was to march against his eldest brother Ahmed, who was at the head of some troops in Asia, whom he defeated and put to death. Selim next invaded the dominions of Shah Ismaïl, king of Persia, who had espoused the cause of Ahmed; he defeated him in a pitched battle, and took Tabriz, the capital of Persia (Sept. 1514). After annexing Diyarbekr to his empire, and recovering Bosnia, which had been occupied by the Hungarians, Selim, in 1517, turned his arms against Kansú-al-Ghauri, sultan of Egypt, whom he defeated and slew at Merj-Dabik, close to Aleppo (Aug. 24, 1516). Having made himself master of Egypt, as well as Syria, Selim returned to Constantinople, where he made a vow not to lay down his arms until he had subdued the whole of Persia. Death however prevented the execution of his project: he was attacked by a disease which terminated his life, Sept. 22, 1520.

SELIM II., Emperor of the Turks, succeeded his father Suleyman in 1566. The principal events of his reign were the suppression of a rebellion in Yemen (1568–70), the taking of Tunis and La Goleta from the Spaniards, and the conquest of Cyprus, which was taken from the Venetians in 1571. In the same year was fought the naval battle of Lepanto, by which the Turkish navy was almost annihilated. [LEPANTO.]

Notwithstanding this success, the Venetians, in 1574, were obliged to make peace upon very disadvantageous terms. During the remainder of Selim's reign, the affairs of the Ottoman Empire were prosperous. Selim died Sept. 12, 1574, and was succeeded by his eldest son Murád.

SELIM III. was born in 1761. On the death of his father, Mustapha III., Abdu-l-Hamid, the brother of Mustapha, ascended the throne, and Selim was placed in confinement, until the death of Abdu-l-Hamid in 1789, when he became sultan. In 1807 he was deposed by Mustapha IV., the son of Abdu-l-Hamid, and in July, 1808, was strangled by order of Mustapha, who was himself immediately afterwards deposed, and succeeded by Mahmud II. [MAHMUD II.; MUSTAPHA IV.]

SELJUKIDES, or SELJUKIANS, a dynasty originally Tartar, and descended from a captain named Seljuk. They settled first in Transoxiana, whence they made their way into Khorassan; and afterwards, under the name of the Iranian, Kermanian, and Rumi dynasties, governed great part of the south of Asia.

Seljuk was the son of Dekak, one of the bravest and most trusted officers of Bigú, chief or khan of the Kipchak Tartars, who inhabited the plain north of the Caspian. This prince brought up Seljuk from his boyhood; but afterwards, for some offence, banished him from his territories; and Seljuk in consequence settled in the neighbourhood of Samarkand and Bokhára, where he laid the foundation of a small state. He also embraced Mohammedanism, and is said to have been killed, at the age of a hundred and seven, in a skirmish with the pagan Tartars on the frontiers of the Mohammedan Empire. Seljuk left three, or, according to others, four sons; but the most influential members of his family were his two grandsons, Mohammed or Togrul Beg, and Daoud or Giafar Beg. Oriental historians differ as to the passage of the Seljuk family into Khorassan, some of them placing this event under the reign of Mahmoud of Ghisni, and others under that of his son Massoud. It appears certain however that Abu Taleb Mohammed Rocneddin, named also Togrul Beg, was crowned at Nishapour, A.H. 429 (A.D. 1038), being the first of the Iranian dynasty of the Seljukides. The conquest of Nishapour was followed by that of Herat and Meru, and shortly after of nearly the whole of Khorassan. The whole of the reign of Togrul Beg (26 years) was occupied in wars with the sultans of the Gaznevide dynasty, and in successive conquests of the provinces of Persia; and on his death, and that of his brother Giafar Beg, the whole conquests of the two devolved upon the son of the latter, Alp Arslan. [ALP ARSLAN.]

In the year 1240, or thereabouts, the Seljukides became tributary to the Moguls, who summoned them to do the most servile homage, deposed and set them up, and even put them to death at their pleasure. Out of the wrecks of this empire arose that of the Othmans, or Turks, founded by Othman, a Seljuk captain.

SELKIRK. [SELKIRKSHIRE.]

SELKIRK, ALEXANDER, was born at Largo, on the coast of Fife, in 1676, and bred to the sea. Having engaged in the half-piratical half-exploring voyages in the American seas, he quarrelled with his captain, one Stradling, by whom he was set on shore on the uninhabited island of Juan Fernandez, with a few books, his nautical instruments, a knife, boiler, axe, gun, powder and ball, for his whole equipment, in September, 1704. After four years and four months' residence, he was taken off by two English vessels, commanded by Capt. Woodes Rogers, in February, 1709. Rogers made him his mate, and he returned to England in 1711. It is said that he gave his papers to Defoe, who stole from them the story of 'Robinson Crusoe;' but Defoe can have borrowed little beyond the mere idea of a man being left alone on a desert isle, there being scarcely anything common to the adventures of the real and fictitious solitary.

SELKIRKSHIRE, an inland county of Scotland, bounded N. by Edinburghshire, E. and S.E. by Roxburghshire, S. and S.W. by Dumfries-

shire, and W. and N.W. by Peeblesshire. A small detached part of the county lies just beyond the eastern boundary, entirely surrounded by Roxburghshire. The form of the county is very irregular. The greatest length S.S.W. to N.N.E., is about 29 miles; the greatest breadth at right angles to the length is about 17 miles. The area is 264 square miles. The population in 1841 was 7990.

Surface, Geology, and Rivers. — The whole county is hilly, but especially the southern and western parts, which are the highest, the direction of the principal streams being from south-west to north-east. The hills vary in height from a few hundred feet to 2000 feet.

The mountains of this county originally appear to have been one large high bed of graywacke and clay-slate, which is now cut by the larger streams into long-shaped divisions, and cross-cut by the smaller streams to a less depth, and into smaller and rounded divisions. The hills are generally ridge-shaped and rounded on the tops. On the western side of the county, towards Peeblesshire, extensive strata of porphyry are found alternating with thin strata of slate and granite.

None of the more useful minerals, coal, lime, or sandstone, are found, at least in quantity and condition such as to be available for working.

Selkirkshire is comprehended in the basin of the Tweed. The Tweed itself crosses the county in the northern part, from west to east, quitting it just at the junction of the Gala, which may be regarded as the lowest spot of the county, 280 feet above the level of the sea. About 10 or 12 miles of the course of the Tweed belong to Selkirkshire. The Ettrick may be regarded as especially the county river; it gave to the district the name, by which it was formerly known, of Ettrick Forest. It rises in the S.W. corner, and flows in a tolerably direct course N.E. till it joins the Tweed on its right bank, on the border of the county a little above Abbotsford; its course may be estimated at from 28 to 30 miles. The Yarrow rises on the W. border, and has its course nearly parallel to the Ettrick, until it reaches Yarrow Ford, where it turns to the S.E. and joins the Ettrick a little above Selkirk; its course may be estimated at about 20 miles, including the lochs of the Lowes and St. Mary's, through which it flows. The Gala, which has the greater part of its course in Edinburghshire, and the Cadon, belong to the northern part of the county; they flow S.E. and join the Tweed on the north bank.

The principal lochs are those of the Lowes and St. Mary, separated from each other by a very narrow neck of land. They are both expansions of the Yarrow.

Agriculture.—The arable land of the county lies on an elevation of from 280 to 800 feet, none of it therefore is the best as to climate. Wheat abounds in the lower districts, and has been raised, at the height of 700 feet, to what would be called a good crop in the Lothians; and, considerably higher, near to the head of Ettrick, oats, turnips, barley, and clover hay are cultivated in regular rotation.

The quantity of land constantly or occasionally under tillage is however very small, and the dampness of the climate renders the county altogether more appropriate for pasturage.

The cattle are chiefly of the Teeswater breed, or rather are a mongrel kind of the short-horned varieties. A considerable number are reared yearly. Many Highland cattle are also grazed on the hills, where they consume the coarse pasturage which the sheep will not touch. Of sheep the Cheviots are the most abundant, but the black-faced sheep are kept on exposed mossy lands, where they are found to thrive best. Some Leicesters have been also introduced.

Divisions and Towns.—Selkirkshire is divided into nine parishes, seven of which extend into other counties. Selkirkshire returns one member to parliament. It has only two towns of any importance:—

Galashiels, a small town and burgh of barony, is situated on the right or southern bank of the Gala, just above its junction with the Tweed, six miles N. by E. from Selkirk. There is a bridge over the Gala, just above the town, which it connects with the village of Buckholmside. The town consists chiefly of one long street, with some bye-lanes and scattered clusters of houses, usually built of stone, and slated. The church, erected in 1813, is a semi-gothic building. The chief manufacture is that of woollens. The market has fallen into disuse, and the fairs are ill attended. Population of the town, in 1841, 1695.

Selkirk, the chief town, and a burgh of barony, is situated on the right or eastern bank of the Ettrick, 6 miles S. by W. from Galashiels. In the middle ages Selkirk was a town of some importance, as appears from its furnishing 80 men to the army of James IV. The town has one principal street, expanding in one part into a triangular market-place, with a public well in the centre. It has been much improved in modern times, and contains some good houses. The church is a large building, erected nearly a century ago; and there is a town-hall with a spire 110 feet high. There is a bridge over the Ettrick, near the town. Population of the town, in 1841, 1675.

History.—This part of Scotland appears to have belonged originally to the Gadeni, and in the period which succeeded the retreat of the Romans was overrun by the Anglo-Saxons of Northumbria. After the cession of the southern part of Scotland by the Anglo-Saxon princes, the Scottish kings had a residence at Selkirk, anciently written Selechyrche. The period of its establishment as a shire is doubtful; it was probably before the death of Alexander III., but the first recorded sheriff was Alexander Synton, A.D. 1292.

SELLES-SUR-CHER. [LOIR-ET-CHER.]

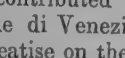
SELVA, GIANNANTONIO, was born at Venice, June 13, 1753. He studied painting under Pietro Antonio Novelli (who died in 1804, aged 75); and architecture under Temanza. In 1778 he set out for Rome, where his countryman Girolamo Zulian, who was ambassador from the republic, gave him employment as an architect. On quitting Rome Selva visited France and England, diligently studying architecture and build-

ing; and he returned to Venice at the close of 1780. There he introduced various practical improvements, and among them greater attention to internal convenience and disposition of plan, setting also the example of a more sober taste in design. The public work to which he owes his chief reputation is the celebrated Teatro della Fenice, erected 1790-91. Selva died at the beginning of 1819. He was a writer upon art; and as well as Diedo contributed to Cicognara's 'Fabbriche piu Cospicue di Venezia.' He also translated Perrault's treatise on the orders, and Chambers's 'Civil Architecture.' There is a portrait and short notice of Selva in Gamba's 'Galleria de' Litterati.'

SELVAS. [PLAINS.]

SEMECA'RPUS, a very small and entirely Indian genus of the natural family *Terebinthaceæ*. *S. anacardium* has long been known for the corrosive resinous juice contained in the nut. This juice is at first of a pale milk colour, but when the fruit is perfectly ripe it is of pure black colour and very acrid, and in both respects resembles that of several other plants of the same family, as in the Cashew-Nut species of *Rhus*, and some of the Varnish-Trees.

SEMIBREVE, a character in Music, equal in duration to two Minims. [MINIM.]



SEMIPHYLLI'DIANS, the third division of Lamarck's Gastropods, consisting of those whose branchiæ are placed under the border of the mantle and disposed in a longitudinal series on the right side of the body alone. The Semiphyllidians respire water only. The two genera placed by Lamarck under this division are *Pleurobranchus* and *Umbrella*.

The *Inferobranchiata* of Cuvier consisted of the genera *Phyllidia* and *Diphyllidia* only; but M. Rang arranges under that order the *Semiphyllidians* as well as the *Phyllidians*, and the following is his definition of the *Inferobranchiata*:—

Animal furnished with a foot for creeping, always very large; branchiæ in the form of a long succession of foliations, at the lower part of the body between the projecting border of the mantle and that of the foot, either all round the body or on the right of it only; the organs of generation always on the same individual; one or two pairs of tentacles.

Sometimes a shell either internal or external.

M. Rang thus defines his second family of the *Inferobranchiata*:—

Animal with the branchiæ on the right side only (with the exception of the genus *Ancylus*, which is sinister).

Sometimes a shell, either internal or external, and in the last case set on the back.

Under the Semiphyllidians M. Rang arranges the following genera:—*Ancylus*, *Pleurobranchæa*, *Pleurobranchus*, *Umbrella*, *Spiricella*, and *Siphonaria*. The genera *Ancylus*, *Siphonaria*, and *Spiricella*, afford fossil species; indeed, of the last genus only one species is known, and that is fossil, viz. *Spiricella unguiculus*.

SEMIQUAVER, a musical character, equal in duration to $\frac{1}{16}$ of a semibreve.

SEMI'RAMIS, a queen of Assyria, who, according to some, reigned about 2000, or, according to others, about 1250 B.C. Her whole history, as it has come down to us, is scarcely anything but a mass of fables. She became the wife of Ninus, first king of Assyria; and on his death, Semiramis succeeded to the power, though Ninus left a son Ninyas. She is said to have built Babylon, and to have adorned it with numerous great and useful works; but the Semiramis of Herodotus (i. 184) was either a different queen of the same name, or his chronology is wrong, for he makes her live about two centuries before Cyrus the Persian. Semiramis is said to have conquered the greater part of Libya and Ethiopia, and to have fought with an Indian king on the Indus. All that we can collect from these stories is that tradition assigned to a King Ninus and to a masculine woman, Semiramis, the foundation of the Assyrian monarchy.

SEMITIC LANGUAGES. [HEBREW LANGUAGE.]

SEMITONE, an interval in music, whose ratio is 16 : 15, as c c♯.

SEMLIN, a fortified town in the Slavonian Gränzland, is situated in 44° 50′ N. lat., 20° 25′ E. long., on the right bank of the Danube, a little above its confluence with the Save, and 3 miles N.W. from the Turkish fortress of Belgrade. It consists of the inner town and the suburb Franzensthal, and has 9300 inhabitants. In the inner town there are some good streets with stone houses. Semlin is the seat of a Greek protopapas, and the residence of the Austrian commander of the district. It is chiefly remarkable as being the main point of communication between the Austrian and Turkish dominions, and containing the greatest quarantine establishment on the Austrian frontier. This establishment consists of a great quadrangle surrounded with a wall twelve feet high, in a meadow between Semlin and Belgrade, containing stone houses and large warehouses. The transit trade of the town is very important.

SEMNOPITHE'CUS, M. F. Cuvier's name for a genus of monkeys peculiar to the warmer parts of Asia (India, the Indian islands, and Malay Peninsula). These monkeys are remarkable for their meagre figure, and the length of their limbs. There are no cheek-pouches, but a large laryngeal sac. The canines are long, and the last molar on each side below has a fifth tubercle. The anterior thumbs are very short. The tail is long. The stomach is sacculated in a very singular manner. For a full account of this anatomical peculiarity, see Prof. Owen's paper in the 'Zool. Trans.,' vol. i., and a paper by Mr. Martin, on the stomach of the *Semnopithecus Nasalis*, in 'Proceeds. Zool. Soc.,' 1837.

One species, the Hoonuman, or Houlman (*Semnopithecus Entellus*), is regarded as sacred in some parts of India, as the lower districts of Bengal,

in Malabar, &c., and consequently becomes a nuisance to Europeans resident there.

As examples of the genus *Semnopithecus*, we may here mention the Budeng of the Javanese, Lutung Itam of the Malays, and Lotong of the natives of Sumatra (*Semnopithecus Maurus*, Horsfield). The black long silky fur of this species is much esteemed, and numbers are killed in Java for the sake of their skins.

The Simpai of the Malays (*S. melalophos*) is a beautiful species, of a brilliant yellow-red above, whitish beneath, with a tuft of black hairs on the forehead in the form of a bandeau; face blue. Locality, the forests of Sumatra.

The *Semnopitheci* are arboreal and gregarious; they have been called by some Slow Monkeys; but they exhibit great activity and address, preserving however in their gambols a sort of gravity and an appearance of apathy, to which circumstance the latter appellation is probably owing. [Nasalis; Pygathrix.]

SEMPERVI'VUM ('always living,' from *semper* and *vivo*, on account of their tenacity of life), a genus of plants belonging to the natural order *Crassulaceæ*. *Sempervivum glutinosum*, Clammy House-Leek, is a native of Madeira. The fishermen of Madeira are in the habit of using this species to rub their nets, which are however previously steeped in an alkaline solution of some kind. They are said to endure as long as if they were tanned.

S. tectorum, common House-Leek, was originally a native of alpine and sub-alpine regions of central Europe, but it has now found its way to the tops of old walls and the thatched and tiled roofs of the houses of nearly all the countries of Europe. This species is remarkable for the change its structure undergoes by cultivation. The common House-Leek is used, both internally and externally, as a popular remedy for many diseases. Its general growth on the roofs of houses seems to have arisen from the belief that it had the power of averting the influence of lightning from buildings. On this account it is also sometimes called the Thunder-Plant. About 36 species of this genus have been described.

SÉMUR. [Côte-d'Or.]

SENA'CIA, a small genus of plants of the natural family of *Pittosporeæ*. The species are natives of the West Indies, Mauritius, and of the Himalayas. The wood of *Senacia undulata*, a native of the Mauritius, is well known and esteemed for its hardness.

SENA'TUS is 'an assembly of elders' (senes). As long as Rome only comprehended one tribe, the Latins of the city on the Palatine, the senate consisted of only 100 members. After the accession of a second tribe, the number of senators was raised to 200; and when a third tribe was united with them the number of senators was increased to 300.

The composition of the Roman senate under the kingly government is a very perplexed question, on which there are various opinions. All writers agree that Tarquinius Priscus raised the number of senators to 300; but they do not agree about the way in which this was done. During the time of the last king, Tarquinius Superbus, the number of senators was diminished by some being put to death and others sent into exile. The number was made up after Tarquinius was driven away, by the addition of the principal plebeians of the equestrian order. The new senators were called 'Conscripti,' or 'co-enrolled,' in opposition to the patrician senators or Patres (fathers); and the whole senate was styled 'Patres Conscripti,' which is 'Patres et Conscripti.' In later times 'Patres' signified the senate; but it appears to have been originally synonymous with Patricii, or the patrician body.

The dictator Sulla increased the number of the senate to 600; and the dictator Cæsar raised it to 900, but by very irregular means. Augustus reduced the number again to 600. What the number continued to be under the Empire is uncertain.

During the latter part of the republic the age of admission into the senate was probably twenty-six, for a man might be elected quæstor at the age of twenty-five, and a quæstor was admissible into the senate after the expiration of his year of office. In the early part of the republic the consuls, dictators, and military tribunes elected or appointed the members of the senate. All the curule magistrates were eligible into the senate, which we might infer, in the absence of any express statement, if a quæstor was eligible. (Liv. xxii. 49, 'unde in Senatum legi deberent.') The quæstorship conferred this right probably from the earliest times, as it did in the time of Sulla, and this explains why the patricians opposed the eligibility of the plebeians to the quæstorship. After the establishment of the censorship the election of persons into the senate was in the hands of the censors. All curule magistrates, that is, consuls, prætors, curule ædiles, and censors, had by virtue of their office a seat in the senate, and might speak. After their office was over they retained this right, but without being real senators. Now vacancies in the senate were filled up at every lustrum (an interval of five years), and it was only on this occasion that the censors might elect those ex-magistrates into the senate whose conduct was unblemished. Hence we have to distinguish between two kinds of senators, real senators (senatores), and such as were allowed 'dicere sententiam in senatu.' (Festus, 'Senatores.') After the establishment of the censorship, the honour of 'princeps senatus,' or 'first man of the senate,' was conferred by the censors, and at first upon the eldest of the living ex-censors, but afterwards upon the person whom they thought the most worthy. (Liv. xxvii. 11.) The plebeians obtained access to the senate through the various magistracies, as they were successively opened to them. At last even the tribuni plebis became, by the possession of the office, full members of the senate. Thus the senate was ultimately filled by the election of the people, for the people chose the magistrates, who by virtue of their office gained access to the senate.

Though the senators were probably among the wealthiest people of Rome, there is no evidence that any property qualification was required before the time of Augustus. If a senator's

property was diminished below the amount, he was obliged to withdraw from the senate, unless the emperor took no notice of it, or supplied the deficiency. Augustus fixed the senatorial age at twenty-five.

Down to the end of the republic the senate of Rome partook more or less of the character of a body representing the people: it was, as Dionysius says, the head and soul of the whole republic, or the concentrated intelligence and wisdom of the whole nation. It is chiefly to the consistency, wisdom, and energy with which the senate acted during a long period that Rome was indebted for her greatness and her success.

At the establishment of the republic no change appears to have been made in the power and authority of the senate. The senate and the people had the sovereign power. At first all measures, whether relating to the administration or legislation, originated with and were prepared by the senate; but this power was afterwards considerably diminished by the attacks of the tribunes of the people. In many cases the original state of things became reversed, inasmuch as laws might originate with the people, and only require the sanction of the senate; or might have the power of laws even without this sanction. A still more formidable blow was inflicted upon the power of the senate when the tribunes obtained the power of invalidating its acts by their intercessio. The power which the senate exercised during the republic may be comprised under the following heads:—

1. The senate had the control of the public treasury (aerarium) (Polyb., vi. 13). The accounts of all the revenues were laid before the senate, and no part of the public money could be expended without their consent.

2. Crimes committed in Italy, such as treason, conspiracies, poisoning, and murder, belonged to the cognizance of the senate; moreover, if any private individuals or any of the allied towns of Italy had disputes among themselves, if they had done anything deserving punishment, or if they required assistance or a garrison, all this was within the power of the senate. (Polyb., vi. 11; Liv., xxx. 26.)

3. All ambassadors sent from Rome, and all commissioners charged with the regulation of the affairs of a newly-conquered province, were nominated by the senate, and the ambassadors themselves were in many cases members of the senate. All foreign ambassadors communicated with the Roman senate. Treaties concluded with foreign nations by a Roman general required the sanction of the senate.

4. The senate assigned to the consuls and prætors their respective provinces, and the senate might at the end of a year propose the prolongation of their power.

5. The senate decreed all public thanksgivings (supplicationes) for victories obtained by the generals of the republic; and the senate alone could confer on a victorious general the honour of a triumph or of an ovatio.

6. The senate in times of great danger could delegate unlimited power to the consuls; and this was done by the formula, 'videant consules ne quid res publica detrimenti capiat:' 'let the consuls see that the commonwealth sustains no damage.' The senate had also the supreme superintendence in all matters of religion, and decided whether the worship of new gods was to be adopted or not.

During the Empire the senate lost its former character, for the Emperor became the sovereign: the senate was a subordinate power, the registrar of the will of the emperor, and a high court of justice. The history of the Roman senate is a very large and instructive subject. This was the body which, by means both good and bad, maintained the integrity of the state, and secured to Rome the dominion of the world, which, when the senate became effête, passed into the hands of the Cæsars.

SENEBIERA, a genus of plants belonging to the natural order *Cruciferæ*. *S. coronopus*, common Wart-Cress. This plant was formerly gathered and eaten as a salad, but it has since been properly neglected, as it is acrid and unpleasant, and must require much boiling to render it eatable. It is native of Europe, North America, and England. *S. didyma* is found on waste ground near the sea in Great Britain. *S. nilotica* is eaten as a salad in Egypt. As these plants possess no beauty, they are not worth cultivating except in botanical gardens.

SE'NECA, M. ANNAEUS, a native of Córduba (Cordova) in Spain, was probably born about B.C. 61. He was at Rome in the early period of Augustus, and on his return to Spain he married Helvia, by whom he had three sons, L. Annaeus Seneca, L. Annaeus Mela, who was the father of the poet Lucan, and Marcus Novatus, who was adopted by Junio Gallio, and took his name. Seneca belonged to the equestrian order, and was rich. He died at Rome, or in some other part of Italy, but the time is uncertain. He was the author of 'Controversiarum Libri Decem,' which are extant in a mutilated state; they are rhetorical exercises on supposed cases. There is also attributed to him 'Suasoriarum Liber,' which are puerile declamations. These works have been printed with those of Seneca the son, and also separately.

SE'NECA, L. ANNAEUS, was born at Córduba perhaps a few years before the Christian æra, and was brought to Rome by his parents when he was a child. His education was rhetorical after the fashion of the times, and he also studied philosophy. In the first year of the reign of Claudius, A.D. 41, he was banished to Corsica, apparently through the influence of Messalina. In his exile he wrote his 'Consolatio ad Helviam,' a consolatory letter addressed to his mother. After eight years' exile he was recalled (A.D. 49), immediately after Agrippina had married her uncle Claudius, and he was made the tutor of Domitius Nero, the son of Agrippina by a former husband. Seneca was unfortunate in his pupil, whose bad disposition he did not or could not correct; for as to the imputation of his having encouraged the boy's vicious propensities, there is no evidence, and it is altogether improbable.

Agrippina poisoned Claudius A.D. 54, and secured the succession to her son Nero, who is known as the Emperor Nero. The funeral speech which Nero delivered over the man whom his mother had murdered was the composition of Seneca. Burrhus and Seneca were much about the emperor, and Tacitus ('Ann.,' xiii. 2) says that they endeavoured to check his wild career, but their efforts were not successful. It is the foundation of some vague charges against Seneca, that he grew exceedingly rich during his connection with Agrippina and her son. His father was a wealthy man, and probably left him something; but it is unknown how he got his immense riches, except they came from Agrippina or Nero. In the affair of the murder of Agrippina, which was accomplished by the order of her own son, A.D. 60, neither Burrhus nor Seneca was entirely innocent. It was almost impossible that Nero could maintain his power, if his ambitious and insolent mother lived; and Seneca, to say the least of him, consented to her death, which he probably could not have prevented by any opposition. But Seneca's greatest crime was being the author of a letter which Nero sent to the Senate, in which he charged his mother with a conspiracy against him, and with committing suicide.

Burrhus died A.D. 63. He had the command of the Praetorian troops, which Nero gave to Fennius Rufus, and to Sofonius Tigellinus, an abandoned man. The two new commanders attacked Seneca, whose wealth excited the emperor's envy, for his extravagance had reduced him to want money. In an interview with the emperor, Seneca offered to give up all that he had, but Nero accepted nothing, and dismissed him with hypocritical assurances of his regard. After this he saw very little of Nero; and in A.D. 65, on the charge of being involved in a conspiracy against the emperor, he received orders to die. The mode of death which he chose was by opening his veins; but he was old and his body was attenuated, and the blood would not flow easily. Seneca's wife, Paulina, insisted on dying with him, and her veins also were opened. Seneca's sufferings were so great that to save his wife the pain of seeing him, he ordered her to be carried to her chamber, when the soldiers, who were sent to see Seneca die, bound up her wounds at the entreaty of the slaves and freedmen, and she lived a few years longer. Seneca attempted to terminate his sufferings by poison, but it had no effect, and he then entered a warm bath, and was finally carried to a vapour stove, where he was quickly suffocated. He died with the courage of a Stoic, for that was the philosophy which he professed; but there was also a theatrical display about his last moments, as if he were acting a part which he wished not to be forgotten. It is difficult to determine the character of a man who was so long about Nero, and wrote so eloquently and well on morality and philosophy. If his conduct was not pure, and it certainly was not in the matter of Agrippina's death, his judgment and his feelings were on the side of virtue. But it was impossible that he should be intimately connected with such a man as Nero without sharing some of his infamy.

Seneca's works, which are nearly all on moral and philosophical subjects, are numerous. Lipsius calls the 'Book on Providence' a golden book. It was the doctrine of Seneca that God is always present with us. His seven books 'On Benefits, or giving and receiving Favours,' contain much excellent matter, though it is not arranged with much order. His 'Epistolæ,' which are 124, do not relate to the ordinary affairs of the day, but are on moral topics, and full of maxims and general remarks. These Epistles have been a favourite book with many readers. Seneca, though he frequently says nothing new, generally expresses it in a peculiarly pleasing and lively manner. The seven books of 'Quæstiones Naturales,' is a collection of natural phænomena from the works of Greek and Roman writers, with a few moral remarks interspersed.

Whatever opinion we form of Seneca, we must admit his great abilities, and his powers as a writer. He was a favourite with Montaigne, no mean judge in such matters. Seneca's philosophy being practical is not much admired by those whose philosophy consists in stringing together hard words with indefinite meaning, in striving to comprehend the incomprehensible.

Ten extant tragedies, in iambic senarii, with choruses interspersed, are attributed to Seneca. They are not adapted to the stage, and indeed were not intended for it. They contain some striking passages, and have some merit as poems, but that is all. They are Greek tragedies in name, but a comparison of any of them—Hippolytus, Œdipus, or Medea—with the Greek tragedies of the same name, will show the total difference between the two things.

There are editions of Seneca by J. F. Gronovius, Leyden; by Ruhkopf, Leipzig; and there is the Bipont, Strasburg, 1809, 5 vols. 8vo. There is an English translation of the works of Seneca by 'Thos Lodge, D. in Physicke,' London, 1614. It contains all the prose works of Seneca, except the 'Apocolocyntosis,' or satire on Claudius, and the fourteen apocryphal letters of Seneca to St. Paul. One of the best editions of the tragedies of Seneca is that by Schröder, Delft, 1728, 4to.

SENECA FALLS. [New York.]

SENECA INDIANS. [North American Indians.]

SENE'CIO (from *senex*, on account of its silvery capitate seed-down resembling the gray hairs of an old man), a genus of plants belonging to the natural order *Compositæ*. The species of this genus are very numerous, but are not remarkable for either beauty or utility. Common Groundsel (*Senecio vulgaris*) is one of the most common of weeds.

SENEFELDER, ALOIS, was born at Prague, Nov. 6, 1771. His father afterwards settled in Munich as a performer at the Theatre Royal, and Alois was placed at the university of Ingolstadt, where he devoted himself to the study of jurisprudence, occasionally performing at private theatres, and employing his leisure time in dramatic composition. In 1789 he wrote a comedy, called 'Die Mädchenkenner,' by which he cleared fifty florins. Losing his father soon afterwards, he was

compelled to discontinue his studies; and being unsuccesful on the stage, he resolved to try his fortune as an author, and published a second play, which did not pay his expenses. While this was passing through the press, Senefelder became desirous of procuring the necessary apparatus for printing his own works. Being too poor to gratify this desire, he endeavoured to discover some other mode of printing, but was defeated in several plans by want of means. The result of a variety of experiments, persevered in in spite of every difficulty, was his discovery, through an accident, of the art known as Lithography. [LITHOGRAPHY.] In order to raise money to carry out his idea, Senefelder enlisted as a private in the artillery, as a substitute for a friend, who promised him a premium of two hundred florins, with which he hoped to procure the means for carrying on his operations in his leisure hours, until he could procure his discharge. With these views he went to Ingolstadt with a party of recruits. But he was doomed to disappointment; for it was discovered that he was not a native of Bavaria, and therefore could not serve without a special licence. While at Ingoldstadt, he was led to conceive the peculiar fitness of his new process for printing music; and he suggested it to a musician of the Elector's band, named Gleissner, who was preparing some music for publication. He did not however receive proper encouragement either from the elector, or the Electoral Academy of Sciences; and continued struggling until 1799, when he obtained an exclusive privilege for Bavaria for fifteen years, and carried on a considerable business, employing his two brothers and two apprentices. Mr. André of Offenbach, now became his partner, and they commenced arrangements for obtaining patents and establishing presses in Vienna, London, Paris, and Berlin. While engaged in this project, he visited London, but without succeeding in his object. Unfortunate circumstances led to a hasty dissolution of this promising partnership, in 1800; and political events also contributed to his embarrassments. In 1806 however an extensive lithographic establishment was formed at Munich, by Senefelder, in connection with Baron Aretin and others. This partnership lasted about four years, during which period a great number of works were executed; some of them for the government. Several other lithographic establishments were also in successful operation in 1809, when Senefelder obtained an engagement which rewarded him for the vicissitudes of the early part of his career. A royal lithographic office was formed about that time for printing the plans of a new survey of the kingdom, of which a great number were required. In 1809, he was appointed to the office of inspector, with a salary of fifteen hundred florins per annum, and permission to carry on his private business also. The subsequent improvements effected by Senefelder, such as the printing in colours, and upon linen, were attributed by himself to the ease and independence which this honourable engagement afforded.

In 1819 Senefelder published an account of his inventions and discoveries 'Lehrbuch der Lithographie.' This work was quickly translated both into French and English, the latter translation being published by Akermann, in 1819, in a quarto volume, entitled 'A Complete Course of Lithography,' &c. In 1819 the Society for the Encouragement of Arts, &c., in London, spontaneously voted their gold medal to Senefelder, as the inventor of lithography. Senefelder died at Munich, Feb. 26, 1834.

SENEGAL is the name of a large river in Western Africa, which enters the Atlantic by two embouchures between 15° 50′ and 16° 30′ N. lat. It is the largest river of Senegambia, and drains nearly half the surface of that country. The eastern and most mountainous parts of Senegambia, those which lie between 10° and 15° N. lat., and between 7° and 12° W. long., are traversed by numerous rivers, which, by their union, form the Senegal. The largest of these branches are the Ba Woolima and the Ba Fing. The Ba Fing rises in 10° 30′ N. lat., 10° 45′ W. long., and flows about 400 miles before it joins the Ba Woolima. The Ba Woolima rises in 13° N. lat., 6° 40′ W. long., and flows 350 miles before the junction. The Senegal, formed by the junction of these two rivers near 14° 10′ N. lat., 10° 30′ W. long., flows out of the mountainous country into the plains. At one point it divides into two large arms, which reunite after having been separated for a distance exceeding a hundred miles. These two arms enclose two islands, called Bilbos and Morfil, which have an average width of six miles, and are separated from one another by a narrow arm of the river. After the two arms of the Senegal have reunited, it flows, chiefly in one channel, for more than 60 miles, but in approaching the sea it divides, near Faf, into two arms. The principal arm continues westward to the sea. The other arm, which is called Saguerai, runs south, and then south-west, and rejoins the principal arm after a course of nearly 50 miles, almost opposite the town of San Louis. The principal arm, having approached the sea within six miles, divides again into two, which enter the Atlantic by separate mouths.

As a navigable river the Senegal is far inferior to the Gambia in depth and freedom of course. The ascent of the Senegal is only practicable in the wet season, and even then the voyage is slow and tedious, partly on account of the rapidity of the current, and partly because of the numerous windings. The river rises after the rainy season, in July and August. The entire length of the Senegal, after the confluence of the Ba Woolima and Ba Fing, is about 600 miles.

SENEGAMBIA is a term adopted by geographers to indicate a part of the western coast of Northern Africa, but it has not always been applied to the same extent of country. Originally it was only used to indicate the countries which lie between the Senegal and Gambia, from the names of which two rivers the term has been composed.

This part of the African coast was visited by Hanno, the Carthaginian admiral. It was again discovered by the Portuguese between 1444 and 1469. The Portuguese also formed several commercial establishments near the mouths of the

principal rivers; but these establishments were neglected after the route to the East Indies had been discovered by Vasco de Gama (1497). The French and the English next tried to get a footing there. The French acquired the Senegal about 1675, and the English the Gambia in 1686. They formed settlements at the mouths of these rivers, and their merchants began to trade on the banks, forming depôts for their goods at certain places. Since that time the discoveries in this part of Africa have been numerous. Modern geographers place the limits of Senegambia between 10° 20′ and 17° N. lat., 6° 40′ and 17° 30′ W. long. The area is about 200,000 square miles.

Senegambia comprehends a lower and a higher country. The lower country lies along the shores of the sea, and the higher extends over the interior. Though the higher region is generally the more fertile and more populous, the several parts of both regions differ greatly in fertility. The country along the Lower Senegal is fertile, though unhealthy and thinly inhabited. Between the mouth of the Senegal and that of the Gambia, and nearly at equal distances from each, lies Cape Verde, 17° 40′ N. lat., a wide projecting promontory, of which the western extremity is a mass of rocks of moderate elevation and volcanic origin. The country between this Cape and the mouth of the Senegal is very little other than a sterile sandy desert. The country contiguous to the shores of the Atlantic, between Cape Verde and the mouth of the river Gambia, is much more varied and fertile. There are several small harbours on this coast, Red Cape, Portudal, Serine, Fatik, and the mouth of the river Joombas. The last mentioned may be entered by vessels of considerable size. To the east of the countries hitherto noticed lies the table-land of the Jaloofs, which is of great extent, occupying the whole country between the valleys of the Senegal and Gambia from 16° to 13° W. long.; it is for the most part an inhospitable region. South-east of this table-land begins the higher country, which does not however immediately rise into mountains, but the western districts consist of numerous hills and short ridges, rising to a moderate elevation. Some portions of this region are fertile. The mountainous region between the two rivers is little known. The country situated immediately on the banks of the Gambia, as far as Pisania, consists of a level alluvial tract extending about two miles from the river. It is subject to annual inundations during the rains. The coast line between Cape St. Mary, situated at the mouth of the Gambia, and Cape Verga, is extremely low, and is intersected by numerous channels, which form many islands. At the back of this low plain, between 14° 30′ and 13° W. long., lies a more elevated country, constituting a kind of second terrace. In no country perhaps on the globe are bees more abundant than in this district; honey and wax are great objects of trade. The Portuguese export large quantities of the wax from their settlements on the several branches of the Rio Grande. The mountain-range south of the Gambia begins a little west of 13° W. long. Near the point where the Gambia and the Rio Grande join, this range forms the western and northern boundary of the table-land of Foota Jallon, a lofty plain of considerable extent, mostly surrounded by high mountains, of which those which enclose it on the south appear to be connected with the Kong Mountains.

Besides the Senegal and Gambia, which are the largest rivers of Senegambia, the country south of the Gambia is drained by two rivers, which are navigated to a considerable distance from their mouth: these are the Rio Grande and the Nuñez, of which the former has a course of about 400 miles, and the latter of 250 miles.

The year is divided between the rainy and the dry seasons. The commencement of the rainy season varies between the 1st of April and 1st of June, and its termination is between the 1st and 31st of December; the heaviest rains occur in July and August, and are frequently accompanied by violent gusts of wind, called *tornadoes*, attended with thunder. About November the *hamattan* is generally felt, a dry and parching wind which blows from the north-east, and is accompanied by a thick smoky haze, through which the sun appears of a dull red colour. Senegambia has long been noted for the great degree of heat to which it is subject all the year round. In all the parts remote from the coast, the hottest part of the year is during the last months of the dry season and at the beginning of the rains; but on the coast the rains immediately depress the temperature several degrees. On the coast the range of the thermometer generally varies between 65° and 95°, and rarely attains 100°. Inland, the temperature frequently rises to 110°.

A country with such a climate and extensive tracts of great fertility must be capable of producing all kinds of tropical vegetable products. It does not appear that any of our grains are cultivated, nor other plants which constitute important objects of agriculture in Europe, with the exception of hemp; but the tropical produce, in rice and maize, fruits, gums, forest-trees, &c., is very abundant. The domestic animals do not differ from those of Europe, except that a few camels are kept in the desert of the Jaloofs and in the countries near the Sahara. The wild animals are exceedingly numerous, and of many species. Iron occurs in vast quantities, but it is little worked. Gold is also obtained.

The inhabitants of Senegambia belong properly to the negro race. But it appears that from a very remote period the Moors, who inhabit the north-western part of Africa, and wander about in the Sahara, have entered Senegambia in considerable numbers, and mixed with the most populous tribes of the negro race. These tribes are known under the names of Foulahs or Foolahs, Jalofs or Jaloofs, Mandingoes, and Serrawollies; and they occupy the more elevated part of Senegambia, leaving to the other minor tribes only the low country which extends along the sea from the mouth of the Gambia to Cape Verga. The minor tribes are the Sousous, Feloops, Papels, Balantes, Landamas, Naloos, and Bagoes.

The larger tribes have established regular government. In most of the small and indepen-

dent states of Senegambia it resembles the government which formerly existed in Poland, the administration of the country being in the hands of the king and an hereditary nobility. Each town or district is under a chief. The whole country along the sea, from the mouth of the Senegal to Cape Verde, and as far inland as the western declivity of the table-land of the Jaloofs, is subject to the king or Dámel of Kayor, who resides in the town of Macaye. Between Cape Verde and the mouth of the Gambia are the small states of Baol, Sin, and Barra. East of Barra is the small state of Badiboo. North of the states of Barra and Badiboo is that of Salum, which extends westward to the sea, where it occupies both sides of the river Joombas. Eastward of Salum are the small states of Yanimaroo, Katoba, and Wooli. South of the Senegal are the states of Walo, Burba, Footatoro, and Galam. Between Galam and Wooli on the Gambia is Bondoo, the most powerful state in these parts of Senegambia. East of Bondoo is Bambouk, which is noted for its gold-mines. [Bambouk.] Besides the above there are several minor states, little known to Europeans.

The European settlements in Senegambia differ materially from those in other parts of the world. They are strictly commercial. The settlers have not acquired the property of any land, except the place on which they have settled, and no cultivation is carried on by them or their people, except at a few spots which are rather gardens than plantations. These settlements were originally established for the purpose of procuring negro slaves for the colonies in North America. The country however had other productions which were valued in Europe, and the natives of the interior were desirous of obtaining several articles of European manufacture, partly for their own consumption and partly to sell them to the nations of Soodan. Accordingly these settlements were not abandoned on the abolition of the slave-trade, like those on the coast of Guinea, and they continue in a thriving state. Each of the three European nations which have formed settlements has taken possession as it were of one of the three large rivers, the French of the Senegal, the English of the Gambia, and the Portuguese of the Rio Grande. Each has built a fortress on an island not far from the mouth of the river, which serves as a safe place of deposit for the goods imported, and thence the productions of the country are shipped. The merchants set out from these places in large river boats with their goods at certain seasons of the year, and ascend the rivers as far as they are navigable. They stop at certain points to which the natives bring their productions to exchange for European manufactures. In a few positions on the banks of the rivers small fortresses or blockhouses are erected, in which some black soldiers with two or three European officers are kept for the protection of commerce. Some merchants, particularly English and Portuguese, have formed commercial establishments not far from these fortresses in those villages which are advantageously situated for commerce. The French settlements are chiefly at St. Louis, Podhor, Bakel, and Goree. The English settlements are at Bathurst, Macarthy Island, and Fort St. James. The Portuguese settlements are at Bissao, Jeba, Bolula, Cacheo, and smaller ones in the interior. St. Louis, Bathurst, and Bissao, are flourishing towns.

Nearly all the articles of commerce which are exported from the European settlements in Senegambia are brought from the interior by small caravans or cafilas, which generally stop at certain places where commercial establishments are found, and take European merchandise in exchange for their goods. A considerable commerce is also carried on between Senegambia and the countries further east.

SENLIS. [Oise.]

SENNA. [Cassia.]

SENNA is a country on the eastern coast of Africa, situated between 16° and 20° S. lat., and between 30° and 37° E. long. It forms the capitancy of the Rios de Senna, the only territory that the Portuguese really possess on the east coast of Africa, their other possessions, as Mozambique, Pemba, &c., consisting only of fortified towns, to which no territory or only a very small territory is annexed. This capitancy is bounded on the east by the sea, on the south by the mountains of Sofala, and it extends to the kingdoms of Quiteve and Barne, which enclose it on the west. To the north of it is the independent kingdom of Moraves, from which it is chiefly separated by the course of the river Zambizi.

The shores of Senna are low, and continue so for some distance inland, but the country gradually rises as we proceed westward. The country is well watered; numerous small rivers descend from the adjacent mountains, all of which join the Zambizi. This river, whose course probably exceeds 800 miles, originates in the countries west of Senna, and enters the sea by many channels, which form, as they flow through the low lands, a great number of islands, covered with rushes, bamboos, and mangroves.

The year is divided between the rainy and the dry season. The rains commence in the beginning of November, and continue to the end of March. The agricultural produce of the country comprises rice, maize, millet, wheat, sugar, coffee, cotton, and a variety of vegetables, fruits, and timber trees. The wild animals are elephants, rhinoceroses, lions, hippopotami, alligators, monkeys, and deer. There are the common domestic animals. Fish and bees are numerous. Gold and iron are the only metals which are known to exist in abundance. The population consists of a few Portuguese and mulattoes, and a great number of blacks. The negroes are partly free and partly slaves of the whites and mulattoes. The colony is divided into several districts. Every district is governed by a Portuguese, who pays annually a small tax to the king, and collects a revenue from the free negroes resident on his land. These negroes pay the taxes in kind, consisting of bees'-wax, fowls, meat, vegetables, and rice.

The only harbour in the colony which is visited by vessels is that of Quilimane, about eight miles from the sea, on the northern arm of the Zambizi.

[Mozambique.] The town of Senna, the capital of the colony, stands in a plain on the banks of the Zambizi. Another of the towns is called Teté. The exports consist of the teeth of the hippopotamus, elephants' tusks, rhinoceros-horns, tiger-skins, honey, wax, and gold-dust. The imports consist of various European goods.

The Portuguese took possession of this coast about the middle of the 16th century.

SENNAAR is a country situated in the north-eastern parts of Africa, on the banks of the Nile, and at the junction of its two great branches, the Bahr-el-Azrek (Blue River) and the Bahr-el-Abiad (White River); comprising both sides of the Nile south of 22° N. lat. It was formerly an independent state, and one of the most powerful in that part of Africa; but it now constitutes a part of the Egyptian province called Beléd-es-Soodán (country of the blacks).

The most fertile portion of this country is that part which lies between the two great branches of the Nile, called the Island of Sennaar. At its southern extremity, between 11° and 12° N. lat., is a mountain-region called Jebel Fungi, containing rich mines of gold and iron. Much of the country is flat, and is irrigated by the overflowing of the Nile. The country west of the Bahr-el-Abiad belongs principally to Kordofan. [Kordofan.] The peninsula between the Bahr-el-Azrek and the Atbara, or Astáboras of the ancients, the largest of its confluents, is a flat country, having a few isolated mountains, which are the retreat of the nomadic tribes of the Shukeriehs and Bisharies, who cannot be dislodged from them, and wander about in the plains with their herds as long as they find pasture. The whole river system of Sennaar belongs to the Nile. [Nile.]

The climate is very sultry. The rainy season extends from May till September. Hurricanes occur in the spring, which drive the sand before them in what appears to be a solid mass. The grain most cultivated is dhurra, or millet (*Holcus sorghum*), and it is an article of great inland trade. Wheat is also cultivated; but other grains are not grown. The cultivation of the sugar-cane seems to be confined to a few places. In the kitchen-gardens there are grown onions, red-pepper, bahmiyeh, a mucilaginous vegetable, chick-peas, kidney-beans, cucumbers, and some plants which are not found in Europe; cotton and tobacco are grown as objects of commerce; near the town of Sennaar there are lemon-trees. There are numerous timber-trees and fruits. Horses are more numerous than in the countries farther north on the Nile; but the chief wealth of the numerous nomadic tribes which inhabit the uncultivated districts of the country, consists in their camels, cattle, sheep, and goats. Wild animals are very numerous, comprising the elephant, rhinoceros, giraffe, lion, hippopotamus, hyæna, crocodile, ostrich, eagle, and vulture. The country contains gold and iron. Some coarse salt is obtained, but the best kind is imported.

The inhabitants of Sennaar are either free cultivators or the descendants of slaves, who from generation to generation live at large, and pay their masters monthly a part of their gains. In appearance there is little or no difference between the slaves and the free population. The nation is certainly of Arabic origin, and speaks no other language than the Arabic; however, as their colour is darker than that of the Bedouin tribes in the vicinity, it is probable that another tribe approaching nearer the negro race has been incorporated with them.

The Pasha of Egypt maintains a body of troops in Sennaar; but only a small portion of the country is immediately subject to the governor, nearly the whole being under the authority of native sheikhs, who annually pay the governor a fixed sum of money. The territories of some of these sheikhs are very extensive. The most populous town is Kartoun, situated at the confluence of the two great branches of the Nile; it has become a populous place in consequence of being fixed upon as the residence of the governor. The houses are built partly of sun-dried bricks and partly of dhurra-stalks. The former capital was Sennaar, which contained a population of from 10,000 to 12,000 individuals. The town was destroyed when the Egyptians occupied the country in 1822, but it has been since rebuilt. Wady-Medinah and Missalemieh, between Sennaar and Kartoun, carry on some commerce with the adjacent country. No place on the Bahr-el-Abiad has risen into importance. At Monkárah are the dockyards in which boats are annually built for the Pasha of Egypt, but it contains no inhabitants except the workmen employed in their construction. In the interior and within the mountain-region of Jebel Fungi is the town of Goleh, which is said to be equal in size to Sennaar, and to be noted for its iron-ware.

That branch of industry in which the Sennaarese are most distinguished is leather, which is of the best quality, and much superior to that made in Egypt or Syria; many useful articles are made of it by the natives. Where dates grow, cords and ropes are made of the fibrous interior bark of the palm date-tree, and in some places of reeds. Cotton-cloth is made by the women for domestic use, but it constitutes also a considerable article of trade in Northern Africa, under the name of damour. The workers in gold, silver, and iron, are very skilful, and execute their work neatly with very simple tools. Pottery is made to a considerable extent; and also carved wooden vessels. In some places coloured straw-hats are made with great neatness, and they are sent to different countries in the neighbourhood. An extensive foreign commerce is maintained at Sennaar. There is one caravan route to Cairo, two to the Red Sea, one south-westward to Beghanni, and another south-east to Alymuir. Few of the articles imported into Sennaar are brought from European markets; the imports are chiefly from various parts of Africa and Asia. The principal articles of export are slaves, the damour or cotton-stuff of Sennaar and Beghanni, gold, ivory, and ostrich feathers. The inland trade of Sennaar is very active, partly in consequence of the great number of caravans which continually traverse the country, and create a great demand for camels, which are brought to

those places through which the caravans pass, and partly on account of the different productions of the several parts of the province.

The ancient history of Sennaar is very little known. It appears that it once formed a part of the empire of Abyssinia, and at a later period of Nubia. About the 14th century it was wrested from Nubia by a family which came originally from Teysafaan, a country in Soodán. In the course of time the sovereigns, called *muks*, became too indolent to transact business, and appointed a vizier, who soon possessed himself of all the power, though he continued to pay outward respect to the muk. This took place about 200 years ago, and since that time the power of Sennaar has been decreasing, and several chiefs have become nominally and really independent. In 1822 the pasha of Egypt conquered Sennaar, deposed the sovereign, and made the vizier a vassal of Egypt.

SENS, a city in the French department of Yonne, is situated on the right bank of the Yonne, in 48° 11′ 54″ N. lat., 3° 16′ E. long., at a distance of 70 miles by railway S.E. from Paris, and has tribunals of first instance and of commerce, a college, and 10,104 inhabitants. The city occupies the site of the ancient *Agendicum*, the chief town of the *Sénones*, whose name it afterwards took. From the end of the first century it gave title to a bishop, and afterwards to an archbishop; the arch-diocese is now united to that of Auxerre. The town is of an oval form, surrounded by ancient walls now partly destroyed, and entered by nine gates, three of which belong to the middle ages; the rest are modern. The streets are mostly narrow and crooked, and the houses ill built. There are two bridges over the Yonne, which is joined by the Vannes on the south side of the town. The principal public buildings are the cathedral, which is a large Gothic structure remarkable for its vast nave and lofty tower; and the college. There are public baths, a public library, a theatre, an hospital, a seminary for the priesthood, and many curious houses of very ancient date. The chief manufactures are—serge, drugget, wax candles, glue, Spanish white, steel ware, razors, crucibles, phosphorus, woollen yarn, beer, leather, &c. There are also iron and copper foundries. The chief trade is in corn and flour for the supply of Paris, wine, wool, hemp, tiles, bricks, bark, leather, hides, timber, oakstaves, &c.

SENSATION. [Nerve.]

SENSES. The senses are the faculties by which we become acquainted with some of the conditions of our own bodies, and with certain properties and states of external things, such as their colour, taste, odour, size, form, density, motion, &c. The senses are five in number, namely, sight, hearing, taste, smell, and touch; and each of them is exercised in the recognition of an impression conveyed along some nerve to the brain. [Eye; Ear; &c.].

SENSITIVE PLANTS is a term commonly applied to those species of plants that possess the property of visibly moving their leaves when they are touched or otherwise stimulated. This term is not applied generally to plants in which any movements can be observed; for the power of moving under the influence of certain external stimulants is a very general property of the tissues of plants, and especially of the flowers.

There are a great number of species of plants of various families, that possess the power of moving under the influence of a slight touch, and we shall here point out some of the most remarkable. That which is best known is a plant belonging to the order *Leguminosæ*, called *Mimosa pudica*. It is a native of tropical climates in moist districts, where it is exposed to a temperature of between 70° and 80° Fahr. It is in its native districts where its excitability is seen to the greatest perfection. A knock upon the ground at a short distance from the plant is sufficient to produce an influence on the leaves; and Von Martius says, that at Rio Janeiro the falling of horses' feet by the way is sufficient to set whole masses of mimosas in motion. When in this country, the motions of the plant are always best displayed in high temperatures.

Another remarkable instance of the movements of the leaves of plants in the order *Leguminosæ* is seen in the *Hedysarum gyrans*. This plant is a native of Bengal. The end-leaf is much larger and broader than the two side leaves. The motions in these leaves are continual, and not produced by any accidental stimulus, as in the last case. Hufeland, who has described the motions of these leaves very carefully divides them into two kinds, voluntary and involuntary.

The involuntary movements are those which take place in the large terminal leaflet, and which are only observable during the influence of the sun's rays upon the plant. Early in the morning the petiole forms an acute angle with the stem, and as the sun's rays get stronger, the leaf, which was previously dependent, begins to rise; this goes on till noon, when the leaf and the petiole are on the same plane; as the sun declines, the leaf begins to fall, and the petiole approaches closer to the stem, till at last, when night comes on, the stem and petiole are parallel and embraced by the leaf, which cannot be separated without destroying its tissues. These movements are seen best in hot weather and clear days. The passing of a few clouds over the sun will influence the movements considerably. This motion is entirely independent of mechanical stimuli, and cannot in any way be increased by their application.

The second kind of motion in these plants, called by Hufeland voluntary, is seen in the two smaller lateral leaflets. This movement consists in the alternate rising and falling of the two opposite leaflets; when one is up, the other is down. By the time the one has attained its lowest point, the other has attained its highest, and they thus both commence a contrary action at the same moment. These movements continue day and night. The rapidity with which they are effected differs according to circumstances. In the hot native climate of the plant these leaves move most rapidly.

Another family of plants that exhibit sensation when touched or stimulated is *Oxalidaceæ*. The *Oxalis sensitiva* has long been known to possess

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this property. *Averrhoa bilimbi* and *A. carambola* are both plants belonging to *Oxalidaceæ*, and have been described by travellers as possessing the property of folding their leaves on the application of a stimulus. But it is not only in these species that this property resides, for Professor Morren of Liege has observed it to occur more or less in all the species of the genus *Oxalis*. His observations were first made on the *Oxalis stricta*, which, if hit smartly on a warm day, will contract its leaves and assume a position as in the ordinary sleep of the leaves of these plants. He has also observed the same movements in *O. acetosella* and *O. corniculata*, and many extra-European species.

In the family *Droseraceæ*, or Sun-Dews, are some plants which exhibit a considerable amount of irritability. The leaves of *Dionæa muscipula*, or Venus's Fly-Trap, have the remarkable property of contracting upon insects that may happen to alight upon their surface. [DIONÆA.] None of the Sun-Dews inclose insects in their leaves in this manner, but the surface of their leaves is covered with long hairs, which secrete a viscous matter. When any insect settles upon the leaf, it is entangled with the viscous secretion; and before it has time to escape, the hairs exhibit a considerable degree of irritability, and curving round, pin the animal down on the surface of the leaf. Other instances of vegetable irritability occur in the *Berberis vulgaris*, *Mimulus*, and *Stylidium*.

Among the *Cryptogamia* are some which exhibit motions more nearly resembling those of the animal kingdom than any we have referred to above. One of the most remarkable of these is the *Oscillatoria*. The movements of this plant were discovered in 1753 by Adanson. When the fibres of this plant are seen in water, they are constantly moving, now doubling themselves into the form of the letter S, then straightening themselves and doubling again, and so on. When a fibre is laid flat upon a plate, it turns itself backwards and forwards. Sometimes these motions are slow, sometimes quick, and at other times they are effected by jerks. These motions only occur in the young fibres, and cease entirely when they are fully grown. These plants are very abundant in ditches, ponds, and damp places, and may be easily procured for the purpose of inspection. The rapidity of their growth is very extraordinary: they grow ten or twelve times their length in the course of as many hours. Some have attributed these movements to their rapid growth, but this will hardly explain their wavering motion.

SENTINEL or SENTRY (from *sentire*, to look or perceive) is a term now applied to an infantry soldier when placed on guard before a public building, on the ramparts of a fortress, or beyond the outposts of an army in the field.

SEPAL (in Botany). This term is applied to the divisions of the calyx. According as the calyx is divided into parts, it has received designations expressive of their number, the term *sepalous*, with a Greek numeral prefixed, being used. Thus, for example, if there are two sepals, the calyx is disepalous; if three, trisepalous; if four, tetrasepalous, and so on. Sometimes the sepals all adhere by their edges; this is called by some writers a *monophyllous calyx*, and by others more properly a *gamosepalous calyx*.

SEPARATE PROPERTY. By the common law of England the husband acquired by his marriage a freehold interest in and a right to dispose of the rents and profits, during the joint lives of himself and his wife, of all the estates of inheritance of which she was at that time seised, or might become seised during the coverture (that is, the existence of the matrimonial relation), as well as a right to an estate for his own life as tenant by courtesy, in the event of his surviving his wife and there having been issue of the marriage. By the common law, also, marriage was an absolute gift to the husband of all the goods and personal chattels of which the wife was actually possessed at that time or might become possessed during the coverture, and it gave him a right to dispose of her chattels real and of such of her choses in action as he should have reduced into possession during the same period. There was no mode by which the wife could take or enjoy any estate or property absolutely independent of her husband.

In course of time, however, limitations of both real and personal property to the separate use of the wife were established in Courts of Equity, and the validity of them has been recognised in Courts of Law. It was at first considered necessary that property which was to be enjoyed by a married woman for her separate use should be vested in trustees for her, but it has since been settled that if either real or personal property is given to the separate use of a married woman, without any appointment of trustees, the husband shall be considered a trustee for her. This principle applies *à fortiori*, when the property is expressly given to the husband for the separate use of his wife. In the same manner the agreement in writing between the husband and wife before marriage, that his wife shall be entitled to any specific property for her separate use, converts him into a trustee for her as to that property; and if the subject of the agreement be real estate, and be such as to give the wife a power of disposition, the agreement will be binding on her heir, and make him a trustee for her appointee. The consideration of what is or is not a valid settlement of property by the husband to the separate use of his wife as against creditors and purchasers, belongs to the general doctrine of marriage settlements.

Property may be limited in trust for a woman, whether single or married, so as to be secured for her separate use, in the event of a future or a second marriage. If personal property, whether in possession or reversion, is settled to a married woman's use, she may dispose of it just as if she were a single woman. But a mere limitation of real estate in fee to the sole and separate use of a married woman, though it enables her to dispose of the rents and profits as a single woman, gives her no power of disposition over the estate beyond what she has by the common law. The gift to the separate use may be accompanied by a power of appointment by deed or by will.

The establishment of the limitation of property

to a wife's separate use has given rise to numerous rules of law, applicable to the various circumstances under which property is so given, enjoyed, and disposed of, the exact statement of which rules belongs to a legal treatise.

The wife, in equity, as at law, can incur no personal responsibility by her engagements as to her separate property, and is liable only to the extent of that property in the hands of her trustees; but in suits respecting her separate estate she is treated in all respects as a feme sole, and is personally answerable for contempt in not obeying the orders of the court. In such suits, if she is a plaintiff, she must sue by her next friend, and not with her husband, who however should be made a defendant to the wife's bill; and if she is a defendant, she must be served personally with process in the cause. She must answer by her next friend separately from her husband, who ought however to be made a party to the bill.

(Roper *On Husband and Wife;* and Sugden *On Powers.*)

SEPARATION. [Divorce.]

SEPIADÆ (*σηπία*), a section of Cephalopoda. Under this head are included all the forms which are commonly termed *Cuttle-Fishes, Calamaries, Pen-Fish, Flying-Squids, Rock-Squids,* &c.

The general characters of this family are as follows:—

Animal in the form of a sack or purse, with or without fins; head large, very distinct, crowned with brachial appendages to the number of eight or ten; arms very unequal, always furnished with suckers on their internal surface, with or without hooks; branchiæ pyramidal; orifice of the organs of generation opening into the branchial pouch, which last communicates with the external surrounding medium by a sort of funnel, the tube of which opens under the neck.

Shell monothalamous or rudimentary, sometimes horny or cellular, but never polythalamous. (Rang.)

Dr. Leach divided the group of *Sepiadæ* into two families, the *Octopods* and the *Decapods.*

Octopods, 8 arms.

Professor Owen, in common with other zoologists, divides the *Octopods* into two groups, the *Testacea* (shelled), and the *Nuda* (naked) ('Cyclopædia of Anatomy and Physiology,' vol. *i.*)

The *Testacea* consist of the genera *Argonauta.* [Paper Nautilus; Belleropho N.]

The *Nuda,* comprise the genera *Eledone* and *Octopus.*

Decapods, 10 arms.

The *Decapods* have no shell, but only a testaceous rudiment or support, which is either cartilaginous or calcareous, in the interior of the back, in the greatest part of the genera.

Under the Decapods range the following genera:—*Sepiola, Rossia, Sepioteuthis, Cranchia, Loligopsis, Onychoteuthis, Loligo, Sepia.*

The power of the Squids or Calamaries (*Loligo*) in taking leaps out of the water, to a great height and a considerable distance, has been long known. They often spring above the bulwarks of a vessel, and fall upon the deck. (See Mr. F. D. Bennett's 'Narrative of a Whaling Voyage round the Globe,' London, 1840.)

Some species of Decapods attain to a very large size, and their strength, the unyielding attachment of the suckers of their arms (in one genus, *Onychoteuthis,* combined with sharp hooked claws in the centre of each sucker), and their ferocity, render them truly formidable.

SEPOY, or SIPOY, the name of the native soldier in the East Indies. The native soldiers in the pay of the British government now form a large army, well trained in European discipline: the men are of a size somewhat below that of European soldiers, but they are quite as brave, as hardy, and as active, capable of undergoing as much fatigue, and of sustaining even greater privations.

The pay of the Sepoy is two pagodas, or seven rupees, per month, which is double the wages of the class of persons from whom they are generally drawn.

Each regiment consists of two battalions of 500 men each. In 1842 the number of native soldiers in the pay of the East India Company was 181,612, besides 4450 native officers, in all 186,062. The number of European soldiers was 19,164, besides 5531 European officers, in all 24,695. The entire Indian army in 1842 consequently amounted to 210,757.

SEPTA'RIA, a genus of Acephalous Mollusks, belonging to the family *Tubicolées* in the arrangement of Lamarck, who defined the shell thus:—Tube testaceous, very long, gently attenuated posteriorly, and divided internally by arched incomplete partitions. Anterior extremity terminated by two slender tubes, which are not chambered in the interior. The *Septaria arenaria* is the type. It is the same shell described and figured by Sir Everard Home in the Philosophical Transactions for 1806, under the name of *Teredo gigantea.* It lives in sand in the Indian seas. A second species, unknown to Lamarck, lives in the Mediterranean, and has been described by M. Matheron, who has shown that the animal is similar to that of Teredo. M. Deshayes considers the two genera identical, and his opinion will probably be hereafter adopted by most naturalists.

SEPTEMBER the ninth month, as the year is now divided by European nations. It consists of 30 days. The old Roman year commenced in March; September was then the seventh month, as the name implies, and the name has been kept to the present day.

SEPTUAGESIMA. [Sexagesima.]

SEPTUAGINT, or *the Alexandrine Version of the Old Testament,* the most ancient translation of any part of the Scriptures, is in the Greek language. It is generally supposed that this version was made during the reign of Ptolemæus Soter, king of Egypt, and between B.C. 298 and 285, for the benefit of the Jews, whom Ptolemæus had carried into Egypt (B.C. 320); and that the name Septuagint is derived from the circumstance of the version having been approved by the Sanhedrim of the Alexandrine Jews. The character of the version varies greatly. The best part is the translation of the Pentateuch,

which was made by a person well versed both in the Hebrew and the Greek. The Septuagint contains the Apocryphal books of the Old Testament. This version is constantly quoted by Josephus, and very frequently by the writers of the New Testament. After the Christian æra, a new version, that of Aquila, was made for the purpose of superseding the use of the Septuagint in the Jewish synagogues. The fathers of the Greek church always quote the Septuagint; and through the Vulgate version, it was used in the Latin as well as in the Greek church.

The principal modern editions of the Septuagint are: 1. The Complutensian, A.D. 1514–1517. [POLYGLOTTS.] 2. The Aldine, Venice, 1518. 3. The Roman, after the Vatican Codex, 1586. 4. The edition of Bos, after the Vatican Codex, with various readings and a critical preface, 1709. Mill's edition, Amsterdam, 1725, is founded on the text of Bos. 5. Grabe's edition, after the Alexandrine Codex in the British Museum, with Prolegomena, Oxford, 1707–1720. 5. Breitinger's edition, reprinted and re-edited from Grabe's, 1730–32. 6. The most valuable and splendid edition is that of Holmes and Parsons, 5 vols. fol., Oxford, 1798–1827. In all these editions, except the last, the version of Daniel is that of Theodotion. The Septuagint version of Daniel was supposed to have been lost till the year 1772, when it was discovered and published at Rome. It was reprinted at Göttingen in 1773 and 1774, and by Dr. Holmes at Oxford in 1805. The best of the smaller editions of the Septuagint are those of Mill, Amst., 1725; Valpy, London, 1819; and Von Ess, Leipzig, 1824. A splendid facsimile of the Alexandrine Codex of the Septuagint has been edited by the Rev. H. H. Baber, 4 vols. fol., Lond., 1816–1820. [ALEXANDRIAN CODEX.]

For an account of the other Greek versions of the Old Testament, see AQUILA; SYMMACHUS; THEODOTION; the 'Introductions' of Horne and Jahn, and the authorities quoted by them.

SEPU'LVEDA, JUAN GINE'S DE, was born at Pozoblanco near Córdova, in 1490. After pursuing his studies, first in Cordova and then at the university of Alcalá, in June, 1515, he went to Bologna, where he obtained admission into the college founded by Cardinal Albornoz, and made rapid progress in theology and the learned languages. Sepulveda afterwards went to Rome, where he found a protector in Cardinal Carpi. Thence he passed to Naples, where he assisted Cardinal Caetano in revising the Greek text of the New Testament. In 1529 Sepulveda returned to Rome and entered the service of Cardinal Quiñones; but in 1536, having been appointed chaplain and historiographer to Charles V., he returned to Spain, where he was entrusted with the education of the eldest son of that emperor, afterwards Philip II. He died in 1574. Sepulveda was a man of great learning, and Erasmus classes him among the best writers of his time. He translated part of Aristotle, and the Commentary of Alexander of Aphrodisias on the same. The best edition of his works, except his translations, is that of Madrid, 1780, in 4 vols., folio.

There is another Spanish writer named *Lorenzo Sepulveda*, who lived about the same time, and gained considerable reputation as a writer of romances. He published 'Romances sacados de Historias Antiguas,' Antw., 1551, 8vo., and 1580, 8vo.; 'Romances sacados de la Historia de España del Rey don Alonso,' Medina, 1562, 8vo.; Antw., 1580, 8vo.; 'Otros Romances sacados de la Historia y de los Quarenta Cantos de Alonso de Fuentes,' Burgos, 1759, 12mo.; 'Cancionero de Romances,' Vallad., 1577, 12mo.

SEQUESTRATION is a process by which the revenues of an ecclesiastical benefice are received and applied by persons other than the incumbent of it. It issues immediately from the bishop in all cases, but it may be founded upon proceedings commenced either in his own court or in the temporal courts. It is a mandate, in the nature of a warrant, addressed by the bishop to the parties who are to execute it. These are called sequestrators, and in general are the churchwardens of the parish. So far as regards their duties under the sequestration, they are a kind of bailiffs. They collect the fruits of the benefice, and apply them according to the directions they receive in each case.

There may be a sequestration where a living is vacant by death; the object of this sequestration is to provide for the expenses of supplying the cure, and to preserve the surplus for the successor. There are many other cases in which a sequestration is founded on proceedings in the bishop's court. By the 17 Geo. III., c. 53, and 1 & 2 Vict., c. 106, the bishop may sequester a living when the incumbent fails to insure the parsonage house. If a judgment has been obtained against a beneficed clergyman, the sheriff cannot execute it except on the lay property of the defendant; and if he has no lay property within the sheriff's bailiwick, the sheriff makes a return accordingly. The plaintiff may then sue out a writ of 'fieri facias' addressed to the bishop, who issues a sequestration, by which the sequestrators are directed to levy the debt upon the tithes and other profits of the benefice; or the plaintiff may sue out a 'sequestrari facias,' addressed to the bishop. The proceedings in sequestration are stated in Burn's 'Ecclesiastical Law;' and Rogers's 'Ecclesiastical Law.'

Sequestration in chancery is a 'writ issuing out of the court, directed to four or more commissioners, empowering them to enter into a defendant's real estates, and to sequester into their own hands not only the rents thereof, but also all his goods, chattels, and personal estate whatsoever, to keep the same until the defendant has fully answered his contempt.' It is the first process against peers or members of parliament, the warden of the King's Bench Prison, or persons in his custody. As regards other persons, it issues upon the occasion of their committing a contempt against the court, by keeping out of the way of the serjeant-at-arms or escaping from his custody, neglecting to put in an answer, failing to perform a decree, &c.

SEQUIN. [MONEY.]

SERA'GLIO, properly *Serai*, the palace of the Emperor of Constantinople. In this sense the

word is also applied to the houses of foreign ambassadors resident at his court. The seraï of Constantinople stands in a beautiful situation, on a head of land projecting into the sea, called the Golden Horn. The walls embrace a circuit of about 9 miles, including several mosques, spacious gardens, and buildings capable of accommodating 20,000 men. That part of the building which is occupied by the women of the sultan has been improperly called seraglio, and hence the word has become synonymous with *Harem*, an Arabic word, which means 'sacred spot,' or that part of the house where the women and daughters of the Mohammedans reside.

SERAI, a large building for the accommodation of travellers, common in Eastern countries. The word is Persian, and means a 'a palace, the king's court, a large edifice;' hence *karáván-seraï*, a place of rest for caravans. In Turkey these buildings are generally called khans, from *khán*, another Persian word, which has a similar meaning.

SERAING. [LIEGE, *Province.*]

SERAMPORE is a small town in Hindustan, built on the western banks of the river Hoogly, about 12 miles above Calcutta, in 22° 45′ N. lat., and 88° 26′ E. long. It extends nearly a mile along the river, but is of very small breadth. This town is built in the European fashion, and belonged to the Danes, who sold it to the British government a few years ago. Serampore has acquired some celebrity as being the principal place where the missionaries for converting the natives to the Protestant religion were established. The mission has since been removed to Calcutta. The inhabitants are about 13,000. The Danes obtained possession of Serampore in 1676.

SERAPHINE, a musical instrument of the keyed kind, in which very short, thin, and narrow steel bars, or springs, put into vibratory motion by means of a bellows acted on by the foot, are used instead of pipes. The principle on which the sounds are elicited is the same as in the ACCORDION and the CONCERTINA. The Seraphine is in the form of a chiffonier, about thirty-seven inches high, forty wide, and twenty-two deep. Its compass is five octaves, including all the semitones, and it is played on in the same manner as an organ.

SERA'PIS was an Egyptian divinity, and the name is, as we may suppose, an Egyptian word. Some suppose that there was an ancient deity of the name, who must be distinguished from a more recent deity, who was imported into Egypt from Sinópe in the reign of the first Ptolemæus. The worship of this deity was also established in several parts of Greece. At Alexandria in Egypt the worship of Serapis was abolished in the reign of Theodosius called the Great.

SERENADE, a word adopted from the French *sérénade*, which has been formed from the Latin *serenus*. A serenade is properly music performed in the open air on a serene night, but is generally restricted to a musical performance given at night by a lover to his mistress under her window.

SERGELL, JOHANN TOBIAS, was born at Stockholm, Sept. 8, 1740. He was apprenticed to a stonemason, but his quickness and cleverness attracting the notice of the sculptor Larchevêque, he was taken by him as a pupil. After assisting him in modelling the two statues of Gustavus Vasa and Gustavus Adolphus, Sergell obtained a travelling pension in 1767, and went to Rome, where he remained nearly twelve years, and produced many works which excited general admiration. He next visited Paris, where his 'Othryades,' a figure of a wounded Greek soldier, half-life size (afterwards placed in the Luxembourg) gained him his reception into the Academy of Fine Arts. From Paris he proceeded to London, whence he was summoned by Gustavus III., king of Sweden, who conferred upon him the appointment of court sculptor. In 1784 he accompanied that monarch in his visit to Rome.

Catherine II., empress of Russia, was afterwards desirous of securing his talents in her service, and made him the most flattering offers, which his patriotism caused him to decline. He died at Stockholm, Feb. 26, 1814.

Sergell may be said to have commenced that reform in sculpture in which he was followed by Canova and Thorwaldsen. One of his finest productions, a composition in alto-rilievo for the Adolph-Frederick Church at Stockholm, exists only in the model, having never been executed in marble. His busts and portrait medallions were highly esteemed, both for fidelity of likeness, and for artistic merit.

SE'RGIUS I., a Syrian by birth, succeeded Conon in the see of Rome, 687, being elected at the time when a priest called Theodore and the archdeacon Paschal were both contending for the see. One of the first transactions of Sergius was to baptize Cedwalla, king of the West Saxons, who had come to Rome for that purpose. In 691 the Emperor Justinian II. assembled a general council at Constantinople, which passed more than 100 canons on matters of discipline and ceremonies, with many of which Sergius disagreed, six of them being in opposition to the Western church. Upon this Justinian sent Zacharias, his general-in-chief, to Rome with orders to arrest Sergius and bring him prisoner to Constantinople. The garrison of Rome however took the Pope's part, and Zacharias was obliged to take refuge in the Pope's apartments, whence he was sent back safely to Greece. A revolution, headed by Leontius, took place at Constantinople soon afterwards, when Justinian was seized, and banished to the Crimea, in 695. Leontius did not long enjoy the fruits of his crime, for he was seized himself, by Tiberius Apsimerus, who became Emperor, and allowed the church of Rome and the Pope to remain undisturbed. Sergius occupied himself in restoring the church of St. Peter, which had been greatly dilapidated. He died A.D. 701, and was succeeded by John VI.

SERGIUS II., a native of Rome, succeeded Gregory IV., A.D. 844. During his pontificate the Saracens from Africa came up the Tiber and ravaged the country, plundering the churches of St. Peter and St. Paul, which were outside of the walls, but they could not enter Rome. They then proceeded by the Via Appia to Fondi, which they sacked. Sergius died in 847.

SERGIUS III. and IV. [POPE.]

SERIA'NA, an entirely tropical South American and West Indian genus of the natural family *Sapindaceæ*, more commonly written Serjania. The species consist of climbing or twining shrubs with tendrils, and the flowers white, arranged in racemes. Some of them are remarkable for poisonous properties. *S. triternata* is acrid and narcotic, and is employed for the purpose of stupifying fish.

SERIES. The mathematical meaning of the word series is, a set of terms, finite or infinite in number, connected together by addition or subtraction, and formed upon some distinct law.

SERINAGHUR, *Srinaghur*, a town of Hindustan, in the presidency of Bengal and province of Gurwal, of which it is the capital. It is about 140 miles north-east from Delhi, in 30° 13′ N. lat. and 78° 45′ E. long. It was formerly the residence of the Raja of Gurwal, and was a place of considerable commercial importance, but it has much declined, the greater part of the merchants having abandoned it and established themselves at Almora.

SERINGAPATAM, a town and fortress of Hindustan, in the presidency of Madras and province of Mysore, is situated on a small but beautiful and fertile island in the river Cavery, in 12° 25′ N. lat. and 76° 44′ E. long. The fortress is at the western extremity of the island. The streets of the town are narrow, crooked, and dirty, but there are several palaces and a great number of pagodas and mosques. The palace formerly inhabited by the sovereigns of Mysore is very extensive, but it is now in a ruinous condition. It has large gardens, with garden-houses and pavilions, and a splendid mausoleum built by Hyder Ali, under which are interred the remains of Hyder and his son Tippoo Saib. The other chief buildings are—the principal mosque, the Indian temple of Sri-Ranga, the arsenal, and the cannon-foundry. There is a handsome bridge over one of the branches of the Cavery. The fortress is occupied by a garrison of British troops. The population is probably under 10,000.

In 1610 the Raja of Bijanaghur obtained possession of Seringapatam, and made it the capital of Mysore. Under Hyder Ali and his son Tippoo Saib it became a place of great wealth and importance, and the inhabitants are said to have amounted to 150,000. Tippoo Saib, in 1789, having seized upon the territory of the Raja of Travancore, Great Britain, then in alliance with the Raja, and bound by treaty to assist him, declared war against Tippoo, who then abandoned Travancore, and retired to Seringapatam. The English concluded a treaty of alliance with the Nizam, June 1, 1790, and with the Mahrattas, July 7. On the 5th of February, 1792, Lord Cornwallis, in conjunction with the Nizam and the Mahrattas, arrived before Seringapatam, which was invested, and the siege pushed with vigour till February 12, when Tippoo, finding himself reduced to extremity, accepted the conditions imposed upon him, and by a treaty, signed March 18, 1792, relinquished one half of his territory, paid a very large sum as indemnity, and delivered up his two sons as hostages for the fulfilment of the treaty. The territories ceded were divided into three equal portions, one of which was given to the Nizam, one to the Mahrattas, and one to Great Britain. Tippoo, in 1798, desirous of regaining his territories, entered into a negotiation with the governor of the Isle of France, from whom he received a body of troops, and also sent an embassy to request assistance from Shah Zemaun, king of Cabul. Great Britain, regarding these demonstrations as a declaration of hostilities, again declared war against Tippoo. On the 30th of April, 1799, Seringapatam was invested by the united armies of General Harris and General Stuart. On the 4th of May the fortress was carried by assault, Tippoo himself being slain while fighting with desperate valour, together with 8000 men.

After the death of Tippoo Saib, the city of Mysore was made the capital of the province of Mysore, instead of Seringapatam.

SERJEANT, or SERGEANT, is a non-commissioned officer in a troop of cavalry or in a company of infantry. The duties of serjeants are to drill or instruct in discipline the recruits of a regiment; and on parade they act as markers or guides in the performance of the evolutions. The serjeants of infantry are now armed with muskets like the rest of the troops. In each company, when a battalion is in line, a covering serjeant is always stationed behind the officer commanding the company; when the ranks take open order, and that officer advances before the front rank, the serjeant steps into his place; but upon the ranks being closed, he falls again to the rear. Four or six serjeants are charged with the duty of guarding the colours of the regiment; they constantly attend the officers who carry them, and are called colour-serjeants. One serjeant in each troop or company is appointed to pay the men; also to keep the accounts relating to their allowances, the state of their necessaries, &c.

The Serjeant-Major is an assistant to the adjutant, and keeps the roster for the duties of the serjeants, corporals, and privates. The Quarter-Master-Serjeant is one who acts immediately under the quartermaster of a regiment in all the details relating to the quarters of the officers and men, the supplies of food, clothing, &c.

SERJEANT, or SERGEANT. (Law.) The word 'serjeant' comes to us from 'sergent,' into which the French had modified the Latin 'serviens.' The word serjeanty, in French 'sergenterie,' was formed from 'sergent,' but was always used with reference to a particular species of service.

In the creation of serjeants, some ancient practices are still retained in those cases where the writ of the serjeant elect issues in term time; but by statute of 6 Geo. IV., c. 95, barristers who receive writs issued in vacation commanding them to appear in the Court of Chancery, and to take upon themselves the estate and dignity of a serjeant-at-law, are, upon appearing before the lord chancellor and taking the oaths usually administered to persons called to that degree and office, declared to be serjeants-at-law sworn, without any further ceremony.

Serjeants at law are the only advocates recognised in the court of Common Pleas. In that

court they retain their right of exclusive audience. This privilege extends to trials at bar, but not to trials at nisi prius, either at the assizes or at the sittings in London and Middlesex.

The serjeants formerly occupied three inns, or collegiate buildings, for practice, and for occasional residence, situate in Chancery Lane, Fleet Street, and Holborn. They have now no other building than Serjeants' Inn, Chancery Lane, which has been lately rebuilt. Here all the common-law judges have chambers, in which they dispose in a summary way, and with closed doors, of such matters as the legislature has expressly entrusted to a single judge, and of all business which is not thought of sufficient magnitude to be brought before more than one judge, or which is supposed to be of a nature too urgent to admit of postponement.

The inn contains, besides accommodations for the judges, chambers for fourteen serjeants, the junior serjeants, while waiting for a vacancy, being dispersed in the different inns of courts.

In Serjeant's Inn Hall the judges and serjeants, as members of the Society of Serjeant's Inn, dine together during term-time.

A full account of the various kinds of serjeants and of the origin of their functions is given in Manning's 'Serviens ad Legem.' See also 'Serjeant,' in 'Penny Cyclopædia.'

SERJEANTS-AT-ARMS are limited by statute 13 Rich. II. c. 6, to thirty. Their office is to attend the person of the king, to arrest offenders, and to attend the lord high steward when sitting in judgment upon a peer. Two of these serjeants-at-arms, by the king's permission, attend the two houses of parliament. In the House of Commons the office of the serjeant-at-arms (as he is emphatically called) is to keep the doors of the house, and to execute such commands, especially touching the apprehension of any offenders against the privileges of the Commons, as the House, through its Speaker, may enjoin.

In some offices about the royal person the principal officer of the department is distinguished by the appellation of serjeant, as the serjeant-surgeon.

SERJEANTY, GRAND. [GRAND SERJEANTY.]

SERK. [GUERNSEY.]

SE'RLIO, SEBASTIA'NO, was born at Bologna in 1475. The study of Vitruvius inspired him with a desire of obtaining greater insight into the architecture of the ancients. He accordingly travelled in Italy for the purpose of exploring its antiquities, and he examined particularly those of Pola, Verona, Ancona, Spoleto, and Rome. He also built a theatre at Vicenza, and at Venice made designs for the church of San Francesco delle Vigne. He afterwards published accounts of his architectural discoveries. During his stay at Rome he composed his treatise on the five orders, for a copy of which he was complimented by Francis I. with three hundred gold crowns. Invited to France by that monarch in 1541, he was appointed architect at the palace of Fontainebleau, and was also commissioned to undertake the court of the Louvre, but generously declined in favour of Lescot. He died at Fontainebleau, in 1552. His reputation rests chiefly upon his writings, 'Opere di Architettura, Libri Sei,' which however display more study and learning than taste.

SERPENS (the Serpent), a constellation which is astronomically distinguished from Ophiuchus, but not mythologically, being the serpent carried by the Serpent-Bearer. The windings of the figure bring it in contact with Aquila, Ophiuchus, Libra, and Hercules.

SERPENT, a musical instrument, a long conical tube of wood covered with leather, having a mouth-piece, ventages, and keys, and bent in a serpentine form. The compass of the serpent is from B flat below the base staff, to c, the treble clef line, including every tone and semitone between these extremes. Its use is now nearly superseded by the OPHECLEIDE.

SERPENTINE, a rock regarding whose origin geologists have differed and perhaps still somewhat disagree in opinion. It is described as stratified in a large tract in the island of Uist; as an irregularly overlying mass in the Lizard district of Cornwall; as a dyke at Portsoy; and as nodular aggregations in the granite of Aberdeenshire. Veins and masses of trap on passing through or being in contact with limestone not unfrequently change the nature of that rock near the junction, and either fill it with serpentinous lines or masses, or produce therein asbestic or steatitic admixtures. It is a very common circumstance among the primary limestones to find light green veins and strings of serpentine, and in the Pyrenees calcareous rocks comparatively of very recent date are similarly altered.

SERPENTS, or OPHIDIANS, an order of Reptiles without feet, and as Cuvier observes, more deserving the name of Reptiles than any other order.

Cuvier divides the *Ophidians* into three leading sections, *Les Anguis* (the Anguians), *Les Vrais Serpents* (the True Serpents), and *Les Serpents Nus* (Naked Serpents). In the first section he places the *Pseudopus* or *Schetopusik*, the *Ophisaurus*, *Anguis* [BLINDWORM], and *Acontias* or *Javelin Snake* [ACONTIAS]; but these forms strictly belong to the Saurians. [SAURIANS.]

At the commencement of the second section he places the *Amphisbæna* and *Typhlops*; but these genera are placed by MM. Duméril and Bibron in certain groups of the Saurians. [AMPHISBÆNA; TYPHLOPS.]

The third section comprehends the genus *Cæcilia* or *Cecilia* [CECILIANS; SIPHONOPS] referred by Duméril and Bibron to the Amphibia. [AMPHIBIA.]

The Serpents, properly so called, have the tympanic bone, or pedicle of the lower jaw, moveable, and nearly always suspended to another bone analogous to the mastoïdian, attached to the cranium by muscles and ligaments which permit its mobility: the branches of this jaw are not united to each other except by ligaments, nor are those of the upper jaw united to the intermaxillary bone in any other manner, so that they can be more or less separated, a conformation which gives

these animals the power of dilating their mouth to such an extent as to enable them to swallow bodies larger than themselves. Their palatine arches participate in this mobility, and are armed with pointed teeth curved backwards, the most marked and constant character of this tribe. Their trachea is very long; their heart situated very far backwards; and the greater number have only one very long lung, with the vestige of a second. These Serpents, says Cuvier, are divided into *Venomous* and *Non-Venomous;* and the former are subdivided into *Venomous with many Maxillary Teeth,* and *Venomous with Isolated Fangs.*

In the *Non-Venomous,* the branches of the upper jaws are furnished throughout their length, as well as those of the lower jaw and of the palatine branches, with fixed teeth which are not pierced: there are therefore four nearly equal rows of these teeth in the upper part of the mouth, and two in the lower.

The *Venomous Serpents* with isolated fangs present a very peculiar structure in their organs of manducation. Their superior maxillary bones are very small, carried on a long pedicle analogous to the external pterygoïd apophysis of the sphenoïd bone, and very moveable: here is fixed a pointed tooth, pierced with a small canal which gives issue to a liquor secreted by a considerable gland situated under the eye. It is this liquor which, when shed into the wound made by the bite of the serpent, causes injury in the body of the wounded animal, and produces effects more or less fatal according to the species which has inflicted the wound. This fang is concealed in a fold of the gum when the serpent does not wish to use it; and there are behind it many germs destined to fix themselves in their turn in order to replace it, if it should be broken in the wound it makes. Naturalists, Cuvier remarks, have named these teeth *crochets mobiles,* or moveable fangs, but it is, properly speaking, the maxillary bone that moves: that bone carries no other teeth, so that, in the venomous serpents, only two rows of palatine teeth are seen in the roof of the mouth. All the venomous species bring forth their young alive, in consequence of the egg being hatched internally before it is laid, whence their general name of *Vipers,* a contraction of *Vivipares.*

These deadly serpents with isolated fangs, though they present external characters of the same nature as the preceding group, have, the greater number of them at least, very dilatable jaws and a very extensible tongue. Their head, wide behind, has generally a ferocious aspect, which announces in some degree their malevolent nature. [VIPERIDÆ.]

A third tribe has the jaws organised and armed nearly as in the non-venomous serpents, but the species have the first of their maxillary teeth greater than the others, and pierced so as to conduct the venom in the same manner as is effected in the venomous serpents with isolated fangs. Such are the *Bungari* and *Hydri.*

With regard to the senses of serpents, the following is a brief summary:—

Touch.—This sense can hardly exist in a high state of development among the reptiles of this order: though there is, no doubt, a sufficient degree of it to regulate the progression of the animal, and to indicate to the constricting serpents and those which live in trees the nature of the surfaces with which their bodies are brought into contact.

Taste.—The tongue in serpents is nearly always cylindrical, deeply bifid at its free extremity, and very narrow. It can be protruded from the mouth, and rapidly vibrated in all directions, and is always moist. The sheath into which it is received can be elongated or contracted. As an organ of taste it cannot be very susceptible. The prey is swallowed entire, and under circumstances which give little or no opportunity for the gustatory exercise of the tongue.

Smell.—The evidence derived from the structure of this organ, and from their habits, does not justify the conclusion that the sense of smelling is very acute in serpents.

Hearing.—In the serpents there is no external auditory meatus, nor any appearance of a tympanum; but there is a guttural canal which leads from the pharynx to the tympanic cavity, and there may be observed a single ossiculum auditûs, which is elongated and widened at its two ends. In other respects the internal ear is organised like that of the Saurians. Such a structure does not indicate the enjoyment of a very acute sense of hearing, and the 'deaf adder' is become almost proverbial; but that serpents have a perception of sounds sufficient at least to warn them of the approach of their enemies or their prey, and something more, may be concluded from the attention that many of them pay to musical sounds.

Sight.—The eyes of the serpent are generally very small, and there is a remarkable peculiarity in the disposition of those organs, for the transparent cornea apparently forms part of the skin and epidermis with which it is detached at each moult. There is no appearance of a tunica conjunctiva; but on dissection it has been found behind the cornea, and occupies the place of eyelids; the sac which this mucous membrane forms receives the tears, and conducts them into the nostrils. There being no eyelid, the eye of the serpent always appears to be fixed and on the watch. The sac above mentioned permits the globe of the eye however to be moved under the anterior part or epidermic cornea. Some serpents, *Trigonocephali* and *Crotali* for instance, have above the eye external cavities, which have been considered as lachrymatory sinuses, like those of the Ruminants: their only analogy however appears to be that of locality, for they receive no tears, and their cavity is always dry. Vision, excepting for some time previous to the change of skin or moult, when it is evidently less perfect, seems to be sufficiently acute in this order.

Progression.—Serpents can creep, glide, grasp, suspend themselves, erect themselves, leap, dart, bound, swim, and dive. Their creeping is a laterally sinuous motion; but their structure forbids their progression by vertical undulations, as they are often represented in the older books of natural history. Their multitudinous vertebræ and ribs,

and the prodigious force of their innumerable muscles, compensate for their want of limbs. All the vertebræ are, so to speak, of the same form from the articulation of the head to the coccyx; and are so connected, both with the ribs and with each other, as to ensure the greatest possible quantity of progressive and constrictive power. [Boa.]

Geographical Distribution.—Cold latitudes do not agree with the true serpents; it is in warm climates that their numbers, their venom, and their volume attain their maximum.

For a minute account of the dental structure of the Ophidians, we refer to Professor Owen's 'Odontography.'

[Boa; Python; Natrix; Dendrophis; Naia; Asp; Viperidæ; &c.]

Fossil Serpents.—Professor Owen, in a Paper published in the 'Trans. Geol. Soc.' (vol. vi. series 2nd), describes some fossil remains of Ophidians, found in the London Clay. These reptiles however appear to have been very sparingly represented in the Fauna of former periods of the history of the earth.

SERPI'CULA (from *serpo*, to creep, on account of the creeping habits of the species), a small African and Indian genus of plants of the natural family of *Haloragecæ*. The plants of this genus are not possessed of any remarkable properties, but they must not be confounded with the *Serpicula* now *Hydrilla verticillata* of Roxburgh, which belongs to the natural family of *Hydrocharideæ*, and which is used in India in refining sugar, in the same way that clay is employed in other countries. A layer of the plant being spread upon the surface of the sugar, water is allowed slowly to percolate through the mass.

SERRAFALCUS, a genus of grasses belonging to the tribe *Festucineæ*. *S. secalinus* is native of Great Britain. *S. racemosus* is a common species in sandy places in the south of Great Britain.

SERRA'NUS, a genus of fishes nearly allied to the Perches, but readily distinguished by their possessing only one dorsal fin and seven branchiostegous rays. The preoperculum is dentate, and the operculum has one or more angular projections.

This genus contains many species, and these appear to be most numerous in the seas of temperate or warm climates.

Cuvier restricts the term *Serranus* to those species which have no apparent scales on either of the jaws. Of this section two species are found off the British coasts (*Serranus cabrilla*, Cuv. and Val.; and *S. Couchii*, Yarrell), and the Mediterranean yields several.

SERRICORNES (Insects), the third family of Pentamerous Coleoptera. They have four palpi, elytra which cover the abdomen, and antennæ, which are for the most part equal throughout, or smaller at the extremity. The Linnæan genera *Buprestis*, *Elater*, *Lampyris*, and *Ptinus* belong to this family, as also do *Melyris*, *Clerus*, and *Cebrio*. The *Ptinus fur* is the little beetle whose larvæ do so much damage among collections of Natural History.

SERTO'RIUS, QUINTUS, was a native of Nursia, in the country of the Sabines. He lost his father very early, but his mother bestowed great care upon his education, and the son entertained for her through life the most tender affection. He first tried his fortune at Rome as an orator; but he soon turned his attention to military affairs, and he distinguished himself for the first time in the campaign of Marius against the Cimbri and Teútones. He was next sent to Spain as tribune under the prætor Didius, and attracted much attention by his courage and prudence. After his return to Rome, when the Marsic war was breaking out, he was made quæstor of Gallia Circumpadana, and commissioned to levy troops. On his return to Rome he was a candidate for the tribuneship of the people, but was defeated by the party of Sulla. Sertorius now joined the party of Cinna and Marius; and after the Marian party was defeated, and Marius himself driven from Italy, Cinna and Sertorius raised fresh troops in Italy, and held out against their opponents. When Marius returned from Africa (87 B.C.) and took bloody vengeance upon his enemies, Sertorius showed moderation. When Sulla returned to Italy in 83 B.C., Sertorius, who was made proconsul of Spain, went to his province, where he began a new career, in which he displayed prudence and courage tempered with humanity. He gained the good-will of the Spaniards by his just measures and his conciliatory behaviour. He also made preparations to oppose the force which Sulla, who was now in possession of Rome, was sending against him; but he was unable to prevent the passage of a Roman army across the Pyrenees, and leaving Spain, he cruised about the Mediterranean, and made a landing on Africa. He again landed in Spain at the mouth of the Baetis (Guadalquivir), and after another military expedition in Africa, he was invited by the Lusitani, the inhabitants of the western part of the Spanish peninsula, to take the command of all their forces. Sulla was now dead. The Lusitanians and the Romans in that part of the country joined Sertorius, who was successful against the Roman forces that were sent against him. He was now joined by Perperna and many men of the Marian party, and he reduced the Roman commander Metellus Pius to such extremities, that the senate sent Cn. Pompeius (B.C. 76) with a large force to support Metellus. Sertorius maintained himself in Spain against the force of the senate until B.C. 72, when he was treacherously murdered by his own adherents, at the head of whom was Perperna. The history of his guerilla warfare, and of his pitched battles, is more like a romance than a history; and yet there is no doubt that Sertorius, during this long campaign, displayed the daring and ability of a great commander, combined with the prudence of a statesman, and the unwearied activity of a common soldier.

The war which he had carried on in Spain was not directed against his country, but only against a party who wished to annihilate him. Plutarch ('Sert.,' 22) says, that after every victory which Sertorius gained, he sent to Metellus and Pompeius, offering to lay down his arms, if they would but allow him to return to Rome,

and to live there in peace and retirement, declaring that he would rather be the obscurest person at home than a monarch in exile. As long as his mother lived, it was principally in order to comfort her old age that he wished to return to Italy; but she died a few years before her son, to his great grief. If we regard Sertorius as a general, it was surely no vulgar flattery that his contemporaries compared him with Hannibal. The details of his wars in Spain are very little known, for the account of Appian ('Civil.,' i. 108–114) is excessively meagre and incoherent; and Plutarch, in writing the life of Sertorius, had other objects in view than to present to his readers a clear description of his military operations. Appian says that the war in Spain lasted eight years, which is incorrect, whether we date the commencement of the war from the time when Sertorius left Italy in the consulship of Scipio and Norbanus (83 B.C.), or from the time that he was invited by the Lusitanians to take the command (78 B.C.).

The adventures of Sertorius have been the subject of a recent work, entitled 'The Faun of Sertorius,' London, 1846.

SERUM, the name given to the essentially liquid part of the blood, and also to the fluid secreted by certain membranes in the human body, such as the pericardium, pleura, peritoneum, &c., which are thence denominated Serous Membranes. The serum of the blood, which separates from the crassamentum during the coagulation of that liquid, has a pale, straw-coloured, or greenish-yellow colour, is transparent when carefully collected, has a slightly saline taste, and is somewhat unctuous to the touch. It has a specific gravity of 1·027 to 1·030 at 50°. It usually constitutes about three-fourths of the blood, the pressed coagulum forming about one-fourth. [BLOOD.]

SERVAN, ST. [ILLE-ET-VILAINE.]

SERVANDO'NI, JEAN JÉROME, was born at Florence in 1695. He studied painting under Panini, but afterwards applied himself to architecture under De Rossi. After passing some time as a scene painter at Lisbon, he proceeded to Paris in 1724, and was engaged in a similar capacity. He now not merely improved the former system of theatrical decoration, but produced an entirely new species of it, in which the scenic illusion and effect were aided by machinery, and heightened by every possible artifice. Among the most celebrated of his works was the representation of the fable of Pandóra (at the Tuileries in 1738), and of the Descent of Æneas into the Infernal Regions.

The chief structure executed by Servandoni is the façade which he added to the church of St. Sulpice at Paris, erected by Oppenord. He died at Paris in 1766.

SERVANT, one who has agreed to serve another. The person whom he has agreed to serve is styled Master. Servants are of various kinds: apprentices, domestic servants who reside within the house of the master, servants in husbandry, workmen, or artificers, and clerks, warehousemen, &c. From the relation of master and servant a variety of rights and duties arise, some of which are founded on the common law, and some on statute.

A contract of hiring and service need not be in writing unless it be for a period longer than a year, or for a year to commence at some future time. If in writing, it is not liable to any stamp duty, unless it apply to the superior classes of clerks, &c. All such contracts imply an undertaking on the part of the servant faithfully to serve the master, and to do his lawful and reasonable commands within the range of the employment contracted for; on the part of the master, to protect the servant and pay him his hire or wages. In all hirings where no time is expressed, except those of domestic servants, it is a rule of law that the contract shall continue for a year. In the case of domestic servants it is determinable by a month's warning, or the payment of a month's wages. Servants in husbandry can only be discharged or quit the service upon a quarter's notice. This rule as to time may of course be rebutted by any circumstances in the contract inconsistent with its existence. In the case of immorality, or any kind of offence amounting to a misdemeanor committed during the time of the service, or of continued neglect, or determined disobedience, a servant may be immediately discharged. If the servant is a domestic, he is nevertheless entitled to wages for the time during which he has served. But in other cases, where the contract is entire for a year, and the service has terminated before the expiration of the time contracted for, in consequence of the fault of the servant, he is not entitled to wages for any portion of the time during which he has served. If a servant becomes unable to perform his duties from illness, he is still entitled to receive his wages. The master however is not bound to pay the charges incurred by medicine or attendance upon his sick servant. If the goods of the master are lost or broken by the carelessness of the servant, the master is not entitled to deduct their value from the wages of the servant, unless there has been a contract between them to that effect. His only remedy is by an action at law against the servant. If a master becomes bankrupt, the commissioners are authorised, on proof that they are due, to pay six months' wages to his clerks and servants. If the wages for any longer period are due, they must be proved like other debts under the fiat. A master may chastise his apprentice for neglect or misconduct, but he will not be justified in striking any other servant. Masters are not compellable to give a character to servants who leave their employment. If they give one which is false, they are liable to an action at the suit of the servant; but in order to recover in such an action, the servant must prove that the character was maliciously given for the purpose of injuring him. If the master, merely for the purpose of confidentially communicating, state what he believes to be the truth respecting a servant, he is not responsible for the consequences of his communication.

By a great variety of statutes, the provisions of which are collected and explained in Burn's 'Justice,' tit. 'Servants,' a special jurisdiction is given to

magistrates over servants in husbandry, and also in many classes of manufactures and other employments. None of these rules of law apply to domestic servants.

Those statutes which relate to servants in manufactures and other employments prohibit the payment of wages in goods, and provide for their payment in money, and for the regulation of disputes concerning them. They also contain various enactments applicable to the cases of workmen, &c., absconding, neglecting, or mismanaging their work, injuring or embezzling the materials, tools, &c., entrusted to them, and fraudulently receiving those entrusted to others. With respect also to this class of servants, magistrates have authority to put an end to the contracts of hiring and service.

A master is answerable, both civilly and criminally, for those acts of his servant which are done within the range of his employment. Thus a master is indictable if a servant commit a nuisance by throwing dirt on the highway; and a bookseller or newsvender is liable, criminally as well as civilly, for libels which are sold by his servant in his shop. This liability of the master does not release the servant from his own liability to punishment for the same offence. The servant is also liable when he commits a trespass by the command of his master. A master, although liable civilly for any injuries arising from the negligence or unskilfulness of his servant, is not responsible for the consequences of a wilful act of his servant done without the direction or assent of the master; but the servant alone is liable.

Any person who interferes with the master's right to the services of his servant, does him an injury for which he is reponsible in an action for damages.

The statute 32 Geo. III., c. 56, is 'for preventing the counterfeiting the certificates of the characters of servants.' Independently of this statute, a person who wilfully gives a false character with a servant is liable to an action at the suit of the party who has been induced by the false character to employ the servant, for any damages which he may suffer in consequence of employing him.

Formerly a settlement was gained by residence in a parish under a contract of hiring and service for a year, but by the Poor Law Amendment Act no settlement can for the future be gained by such means.

SERVE'TUS, MICHAEL (whose family name was Reves), was born at Villanueva, in Aragon, in 1509. He was the son of a notary, who sent him to the University of Toulouse in order to study the law, instead of which he appears to have devoted his attention principally to theology.

In 1530 he took up his residence at Basel, and there he first broached those opinions which afterwards drew down upon him the persecution of Calvin. His first work, a treatise on the doctrine of the Trinity, was published by a bookseller of Basel in 1531, but the opinions which it contained were so contrary to those usually received, that the man feared to print it at Basel, and procured its publication at Haguenau. In the following year Servetus wrote a second treatise, in the form of dialogues, on the same subject, in which he corrected some errors in his former work, but without retracting any of the opinions.

We next find Servetus at Lyon, where he remained three years, occupying himself principally with the study of medicine. On leaving Lyon he visited Paris, where he took the degree of M.A., and afterwards of doctor of medicine.

In 1543 Pierre Palmier, archbishop of Vienne in Dauphiné, meeting with Servetus at Lyon, induced him to return with him to Vienne. Servetus devoted himself to the practice of medicine in this place, but he still carried on a controversial correspondence with Calvin, which ended in a quarrel. In 1553 appeared his 'Christianismi Restitutio,' printed at Vienne, but without name or date. The work caused a great sensation. Servetus was suspected to be the author, was arrested and imprisoned, but would in all probability have been acquitted, for want of evidence against him, had not Calvin, through the medium of Trie, forwarded to the Inquisition at Vienne a portion of manuscript and several private letters which he had received from Servetus.

Servetus escaped from prison, where he had not been strictly guarded, but was burnt in effigy at Vienne, June 17, 1553. He fled to Geneva, in which town he kept himself closely concealed, but was arrested through Calvin's influence on the day before that on which he was about to start for Zürich on his way to Italy. When in prison he was treated with the greatest cruelty, and he was denied the assistance of counsel. Calvin's own servant, one La Fontaine, appeared as the accuser. Servetus was brought to trial Aug. 14, 1553. Calvin drew up the articles of accusation, in which the calumnies against himself are alleged as part of the crime of Servetus; and further he reserved to himself the office of disputant upon theological subjects with the prisoner. The trial before the council of Geneva was a mere mockery. After being detained five weeks in prison he was furnished with a copy of the charges against him, drawn up by Calvin, to which he sent a brief written answer, and it does not appear that he defended himself in open court after Sept. 15. It was secretly determined in the council of Geneva to put Servetus to death, but the matter being one of importance it was thought advisable to send copies of his works and of the evidence against him to the clergy of the four Protestant cantons of Zürich, Basel, Berne, and Schaffhausen, and to ask their opinion concerning his guilt. These letters were dispatched about the end of September. The replies all concurred in condemning the writings of Servetus, but did not recommend that the author should be put to death, though Calvin chose to put that construction on their replies. Accordingly, on Oct. 27, 1553, Servetus was brought to the stake, and his sufferings are stated to have been unusually severe and protracted. No act of barbarity perpetrated by the Roman Catholics ever surpassed the burning of Servetus.

The works of Servetus have had an adventitious value imparted to them by their rarity. Mr. Hallam is of opinion that the notions of Servetus

concerning the Trinity were not Arian, but rather what are called Sabellian. The 'Restitutio Christianismi' contains a passage which has led some to say that Servetus well nigh discovered the circulation of the blood. The passage is given entire by Dutens, 'Origine des Découvertes attribuées aux Modernes,' 4to., London, 1796, p. 163.

SERVIA, a principality tributary to Turkey, is bounded N. by the Austrian territories of the Bannat and Slavonia, E. by Wallachia and Bulgaria, S. by Rumili, and W. by Bosnia. The length E. to W. is about 170 miles; the breadth is about 100 miles. The area is about 12,000 square miles. The population is about 400,000. It lies entirely in the basin of the Danube, which river runs along its northern boundary, and is joined by the Save, which divides Servia from Austrian Slavonia. Servia is a country of mountains and valleys, in great part covered with ancient forests. The country has excellent pastures, in which are reared numerous herds of cattle. The Servians are mostly of the Greek or Eastern church. They are a branch of the great Slavonian race, and their language is one of the most polished of the Slavonian dialects.

The principal towns of Servia are:—*Semendriu*, or *Sant Andriya*, situated at the confluence of the Jessava with the Danube, a fortified town with about 12,000 inhabitants, and the residence of the archbishop-primate of Servia, and the place of assembly of the senate; BELGRADE; *Zabatz*, or *Schabacz*, near the Save, a fortified town; *Usicza*, near the borders of Bosnia, a town of 6000 inhabitants, carrying on a considerable trade; *Vallievo*, a place much frequented for its markets; *Kragojewatz*, a small town in the centre of Servia, where a diet of the representatives of Servia proclaimed, in 1830, Milosch and his heirs princes of Servia The superior court of justice of the principality sits at Kragojewatz, which is also the usual residence of the prince.

The country of Servia under the Roman Empire formed the province of Mœsia Superior. It was invaded by the Goths under the Emperor Valens, and some centuries later by the Servi, a tribe of Slavonians. During the subsequent decay of the Eastern Empire, and its conquest and partition by the Latins, the Servians established themselves firmly in the country of Mœsia, forming an independent principality under a prince styled Despotes. With much difficulty the Servians maintained their independence in opposition to the Turks, till Mohammed II., after taking Constantinople, finally conquered Servia, which he annexed to his empire, with the exception of Belgrade, which was only taken in 1522 by Solyman the Great. Servia, Belgrade, and part of Servia were conquered by Austria in 1717. In 1791 they were restored to the Sultan.

About the year 1804 the Servians, availing themselves of the revolt of Passwan Oglu, pasha of Widin, rose in arms throughout the country against the Porte. They chose for their leader George Petrowitsch, surnamed Kara, or the 'black.' In January, 1806, two numerous Turkish armies, one from Bosnia under Bekir Pasha, and the other from Nissa in Rumili under Ibrahim, pasha of Scutari, entered Servia. Kara George had no more than 10,000 men, but they were determined, and knew well the country and the intricacies of its forests. He kept in check both armies, and in the month of August defeated the Pasha of Bosnia, and drove him back across the Drina with great loss. He then turned rapidly against the Pasha of Scutari, who proposed a truce. But the truce not being ratified by the Porte, George surprised and took Belgrade, except the citadel, which surrendered in 1807. Servia was now free from the Turks. A sort of military government was formed, consisting of the wayvodes, or chief proprietors of the various districts, each of whom was at the head of a body of cavalry formed of his tenants and friends. Mutual jealousies and dissensions soon broke out between the principal wayvodes and Kara George; but George continued to possess supreme power in the country till 1813, when he was driven into Austria, where he died. Universal discouragement followed; the Turks occupied the whole country, and entered Belgrade. Servia became again a pashalik. The wayvode Milosch Obrenowitsch alone kept up the insurrection about Jagodino; and by a succession of exploits marked by courage and magnanimity he succeeded in obtaining for Servia a pasha approved by the Servians. Belgrade and the other fortresses were to remain in the hands of the Turks, but the Servians retained the administration of the country and their senate, and they alone taxed themselves. Milosch restored with some modification the constitution established by Kara George. Servia pays a fixed amount of tribute to the Porte, which is yearly delivered by the prince into the hands of the pasha.

SERVICE, the name given in English cathedral music to the 'Te Deum' and 'Jubilate,' the 'Magnificat,' and 'Nunc Dimittis,' the 'Cantate Domino,' and 'Deus Misereatur,' collectively or separately; and is sometimes applied, very erroneously, to the whole or portions of the mass.

SERVITES, or Servants of the Blessed Virgin, a religious order instituted in Tuscany, 1233, by seven Florentine merchants. This order, though subjected to the rule of St. Austin, was nevertheless erected in commemoration of the most holy widowhood of the blessed Virgin, for which reason its monks wore a black habit, and observed several rules not practised in other monasteries. This order was reformed in 1593, and continues to exist in Italy. Father Paul Sarpi, the author of the 'History' of the Council of Trent,' was a Servite.

SERVITUDES (servitutes). A servitus in the Roman law signifies that the owner of some particular property is bound in respect to some other person, either simply as such person, or as being the owner of a particular property, either not to do certain acts to his property, or to allow that other person to do some particular acts to the property. The rights of this kind which one person may have on the property of another are also called servitutes. The thing which is the object of the servitus, is said 'servire,' to owe a servitus. It follows from the definition, that a man can only have a servitude

in another man's property, and in a corporeal thing; and that the owner of the servient property is not required to do anything in order that the other may enjoy the servitude ('Dig.' 8, tit. 1, s. 15): his duty consists in not doing, and in permitting to do. The servitude must be a thing which gives some profit or advantage to him to whom it is due. In case of doubt there is no presumption in favour of a servitude; the terms in which it is established are to be strictly interpreted, and its exercise to be strictly according to the right, and in the way least prejudicial to the owner of the servient property. A man must be the owner of a property, or have a dominium utile (that is an equitable interest) in it, in order to be able to encumber it with a servitude.

Servitutes were either a right belonging to some particular person, which ceased with his life, unless they were granted to him and his heirs, and in this case they were called servitutes personarum or personales: or they were attached to a piece of ground as the subject, and could be exercised by any person who was in the possession of the ground, and were called jura, or servitutes prædiorum or rerum, and sometimes servitutes simply. Personal servitudes were comprehended under the heads of Ususfructus, Usus, Habitatio (a lodging in another person's house), and Operæ Servorum et Animalium (the use of another person's slaves or beasts). The servitutes prædiorum, or Prædial servitudes, correspond in some cases to the Easements of the English system; of which a right of way which the owner of one piece of land may have over an adjoining piece of land belonging to another, is an example. The personal servitudes of the Roman law are treated differently in the English system: for instance, a life estate, as we call it, in lands, is one of the Roman personal servitudes, which they called Ususfructus.

SERVITOR. [SIZAR.]

SE'RVIUS TU'LLIUS, the sixth king of Rome, reigned from 578 to 534 B.C. The history of his birth and early years was handed down by tradition in three different ways. When Tarquinius Priscus was murdered by the sons of Ancus Marcius, Servius was made king of Rome; and according to the common history, he married his two daughters to Lucius and Aruns Tarquinius, the sons of his predecessor.

The only war that occurred during his reign was with the people of Veii and some other towns of Etruria. The most memorable events of the reign of Servius Tullius are his fortification and extension of the city, and the new constitution which he is said to have given to the Roman state. Several of the Latin towns already belonged to Rome, and had grown up with it into one nation, and this nation was leagued with the other independent Latins. Servius effected a federal union among these nations, and induced the Latins, who had hitherto held their general meetings at the fountain of Ferentina, to build at Rome, on the Aventine, a temple of Diana, as the common property of the Latins and Romans. The Latins agreed, and this was on their part a tacit acknowledgment of the supremacy of Rome. (Liv., i. 45; Dionys., iv. p. 230.)

Though Servius was the favourite of the people, he ultimately terminated his life in the tragic manner so inimitably described by Livy (i. 47). Lucius Tarquinius, the son of Tarquinius Priscus, had never given up the hope of occupying the throne of his father; and stimulated by Tullia, the wife of his brother Aruns, he agreed with her to murder his wife and his brother, and to unite himself with her. Lucius, urged on by his unnatural wife, one day appeared in the senate with the badges of royalty. As soon as the aged king heard of the rebellious act, he hastened to the curia, and rebuked the traitor, but he was thrown down the stone steps of the curia, and on his way home he was murdered by the servants of his son-in-law. His body was left lying in its blood. Tullia, the wife of Lucius, anxious to learn the issue of his undertaking, rode in her chariot to the curia. On her way thither she found the corpse of her father, and ordered her servant to drive over it. The place where this took place was ever after termed the Vicus Sceleratus.

The constitution of Servius Tullius was always considered by the Romans as the basis of their polity. The examination of it and of the different opinions about it, belongs to a critical history of Rome. One important part of this constitution was his census, according to which he divided the whole Roman people into five classes, which were determined by the amount of property which individuals possessed. This division into classes was a division both for military and civil purposes. The five classes were subdivided into centuries, each of which had a vote in the great assembly which they formed (comitia centuriata). The number of centuries varied in the different classes; the first class, though the smallest in numbers, contained the greatest number of centuries or votes, namely eighty; and the other four classes were so divided as to make up the whole number of centuries or votes to 170. Five other centuries however were added to the 170, thus making 175 centuries, and these composed the infantry of the Roman army. The cavalry was also distributed into centuries, twelve of which existed before the time of Servius, who added six more.

Respecting the reign and constitution of Servius Tullius, the reader may consult Niebuhr's 'Roman History,' and Savigny; 'Vermischte Schriften, vol. i.; also Zumpt, 'Ueber Abstimmung des Römischen Volkes in Centuriat Comitien,' Berlin, 1837, 4to.; Göttling, 'Geschichte der Römischen Staatsv.,' p. 230-267; Rubino, 'Ueber den Entwickelungsgang der Römisch. Verf. bis zum Höhepunkt der Republik,' vol. i., Marburg, 1839, 8vo.; Hüllmann, 'Römische Grundverfassung,' Bonn, 1832, 8vo.; and, by the same author, 'Ursprünge der Römischen Verfassung, durch Vergleichungen erläutert,' Bonn, 1837, 8vo.

SE'RVIUS, MAU'RUS HONORA'TUS, a Roman grammarian, who lived about the close of the fourth century. The principal works of Servius are his Commentaries on the 'Æneid,' the 'Georgics,' and the 'Eclogues' of Virgil. These

commentaries are printed with several of the early editions of Virgil. There is a separate edition of them by H. A. Lion, Göttingen, 1825-6, 2 vols., 8vo. Three small grammatical works of Servius are printed in the 'Grammatici Latini' of Putschius.

SE'SAMUM, a genus of plants of the natural family *Sesameæ*, sometimes called *Pedalineæ*, containing only a few genera and species. The name *Sesamon* occurs in Greek authors. *Simpsen* is the Egyptian and Arabian name of one of the species, remarkable for the quantity and quality of the oil expressed from its seeds. The oil is employed as an article of diet in Eastern nations, on which account the seeds form an article of commerce from India and Egypt in the present day. The oil is bland, of a fine quality, and will keep many years without becoming rancid; it is often used in India as a salad oil. The leaves of the plant are mucilaginous, and are employed for poultices.

SESBA'NIA, a genus of plants of the natural family of *Leguminosæ*, which is so named from the Arabic name of the species which is indigenous in Egypt. The rest are found in the equinoctial parts of the world, but the most remarkable in India. *S. Ægyptiaca*, the Egyptian species, found also in India, forms a small and very elegant tree; its wood is employed in making the best charcoal for gunpowder.

SESLE'RIA, a genus of grasses belonging to the tribe *Sesslerieæ*. *S. cærulea* is the only British species. It is found chiefly on mountains. *S. Quitensis* is the *Festuca quadridentata* of Humboldt and others. Humboldt tells us that it is very poisonous.

SESO'STRIS (Diódorus calls him Sesoosis, sometimes he is called Ramses the Great), one of the early kings of Egypt. He is the third king of the 12th dynasty of Mánetho, and, according to Herodotus (ii. 102), the successor of Moeris; but Diódorus (i. 53) places him seven generations after Moeris. The exact time of his reign is uncertain, but the most common opinion is that it was about the year 1500 B.C. What has been handed down to us as the history of Sesostris, contains such exaggerated accounts of his military exploits, that we must suppose the achievements of several kings, who perhaps bore the same name, to be ascribed to one. There is however no reason to doubt his personal existence, and his history serves to explain many of the remains of Egyptian art and architecture.

His reign is represented as a succession of conquests, which began with an expedition into Arabia during the lifetime of his father, and was followed by an expedition into the countries west of Egypt. On coming to the throne he divided Egypt into thirty-six districts; and raised an enormous army for the conquest of the whole earth. He subdued the Ethiopians, and sent a fleet down the Red Sea to visit the coasts of India. Sesostris with an army penetrated as far as the Ganges, and even to the extreme eastern shores of Asia. He then returned, and carried his victorious arms as far as the Tánais (the Don), leaving memorials and monuments of his conquests. The columns erected in Palestine, and two figures of the king cut on the rock of Ionia, were seen by Herodotus (ii. 106).

After nine years of conquest he returned to Egypt, where he narrowly escaped being burnt in his tent by the treachery of his brother. Two of his children perished in the flames; but to record his own escape, and that of his wife and four of his children, he erected colossal statues in the city of Memphis, which Herodotus saw (ii. 107, 110). The rest of his reign was employed in adorning Egypt with monuments, and enriching it with useful works. The last of his great works were two obelisks of hard stone, each 120 cubits high, on which he recorded the greatness of his power, the amount of tribute which he received, and the number of conquered nations. In the reign of Augustus an obelisk 116 feet high, said to have been erected under Sesostris, was conveyed to Rome and set up in the Campus Martius. (Plin., 'Hist. Nat.,' xxxvi. 14.)

After Sesostris had reigned 33 years, or, according to Manetho, 66 years, he was seized with blindness, and put an end to his life. (Compare Wilkinson's 'Manners and Customs of the Ancient Egyptians,' i. p. 63, &c., and 99, &c., who places the epoch of Sesostris about the year 1355 B.C.)

SESSION, COURT OF, is the principal tribunal of civil jurisdiction in Scotland. As at present constituted it dates back to the year 1532; but it was then reconstructed. The number of the court as finally established in 1532 was fifteen, who were presided over by a Lord Chancellor. But at the union with England it was not thought necessary to retain a separate chancellor for Scotland, and the court from that time was presided over by the Lord President, who previously presided in the absence of the Chancellor. In 1808 the Court of Session was divided into two divisions: the head of the court, the Lord President, who is also now Lord Justice-General, or head of the supreme criminal court, presides in the first division, and the Lord Justice Clerk, or deputy head of the criminal court, presides in the second. In 1815 trial by jury in civil cases on the English system was introduced in Scotland. A separate tribunal was established for jury cases, presided over by a Lord Chief Commissioner, but in 1830 the practice of jury trial was united with that of the Court of Session. It is still only adopted in a limited number of cases, and is far from being popular or satisfactory. In 1830 two separate courts of limited jurisdiction and small practice—the Admiralty and Commissionary Courts—were absorbed in the Court of Session, and the number of judges was at the same time reduced from fifteen to thirteen. By the act of 1830 (2 Geo. IV., and 1 Wm. IV., c. 69), as carried out by a later act (1 & 2 Vict. c. 118), eight of the judges, formed into two courts of four judges each, sit in the two divisions of the Inner House, where each division form a court of second instance. The other five judges are called the Lords Ordinary, and each of them holds a separate court, which, in reference to the court of further resort, is called the Outer House. The judgment of a lord ordinary on a closed record is final in the outer house, but it

may, within a limited time, be carried by a 'reclaiming note' to which the record is appended, to the inner house, where it may be pleaded again on the record as made up in the outer house. The system of pleading has of late years been much abbreviated and systematised, and this, added to the reduction of the number of judges who sit and give their views on each case, has materially abbreviated the procedure, although it is still the practice for the whole court to be assembled and consulted in difficult cases. The jurisdiction of the Court of Session embraces all civil questions. The Court of Session appoints guardians, receivers, &c., or otherwise sees to the protection of property, or of persons where discretional protection or direction are necessary, and there is no person competent in ordinary course of law to act. In 1839 (2 & 3 Wm. IV. c. 36), the judges of the Court of Session were appointed according to a certain rotation to perform the duty of judges of the court of justiciary in matters criminal, and those of judges of the court of exchequer, where the duty is of a very limited character. By an old practice in Scotland each 'Senator of the College of Justice,' as the judges of the Court of Session are officially called, takes the title of Lord.

SESSION, KIRK. [SCOTLAND, x., 712.]

SESSIONS. A session is the period during which any court of law sits; but the term Sessions is commonly used to denote the meeting of the justices of a county, or other district which has a separate commission of the peace, for the execution of the authorities conferred by the crown by that commission and of other authorities given by Act of Parliament.

County Sessions.—The commission of the peace issued by the crown for the purpose of creating county magistrates, consists of two branches. The former relates to the powers to be exercised by justices individually and separately. [JUSTICES.] The second branch of the commission creates the powers of the justices when assembled in sessions. It begins as follows:—'We have also assigned you, and every two or more of you (of whom any one of you, the aforesaid A. B., C. D., E. F., &c., we will shall be one), our justices, to inquire the truth more fully, by the oath of good and lawful men of the aforesaid county, by whom the truth of the matter shall be better known, of all and all manner of felonies, poisonings, enchantments, sorceries, arts magic, trespasses, forestallings,' &c.

The words 'of whom any one of you the aforesaid A. B., C. D., E. F., &c., we will shall be one,' constitute the Quorum Clause, so called because when the commission was in Latin, the clause ran '*quorum* A. B. vel C. D. vel E. F. &c., unum esse volumus.'

A meeting of the justices held for the purpose of acting judicially for the whole district comprised within their commission constitutes a court of General Session of the Peace. By 12 Rich. II. c. 10, sessions are required to be held in every quarter of the year, or oftener if need be. The four sessions so held are styled courts of General Quarter-Sessions of the Peace, or Quarter-Sessions. By different statutes the quarter-sessions are directed to be held at uniform periods.

Both general sessions and general quarter-sessions are held by virtue of a precept under the hands of two justices, requiring the sheriff to return a grand-jury before them and their fellow-justices at a day certain, not less than fifteen days after the date of the precept, at a certain place within the district to which the commission extends, and to summon all coroners, keepers of gaols and houses of correction, high constables, and bailiffs of liberties within the county.

Persons summoned on grand or petty juries ought to be males between 21 and 60 years of age, who are possessed of 10*l.* a year in lands or rents, or 20*l.* a year in leaseholds for an unexpired term or terms of 21 years or more, or who are householders, rated to the poor on a value of not less than 20*l.* (in Middlesex 30*l.*), or who occupy houses containing not less than fifteen windows, and who are not peers, judges of the superior courts, clergymen, Roman Catholic priests, dissenting ministers following no secular employment but that of schoolmasters, and many others.

The justices in sessions have criminal jurisdiction, to be exercised partly according to the rules of Common Law and partly pursuant to different Acts of Parliament; they have also jurisdiction in certain civil matters created by different statutes; they have an administrative power in certain county matters; and they have power to fine and imprison for contempt.

1. The criminal jurisdiction of justices in general and quarter-sessions is now defined by the 5 & 6 Vict. c. 38.

2. The quarter-sessions have an original jurisdiction in all matters required to be done by two or more justices, except in cases in which a power is given of appealing to the sessions.

3. Statutes which give summary jurisdiction to one or more magistrates, in most cases allow their decision to be brought before the sessions by way of appeal. When questions of difficulty in matters of law present themselves upon the hearing of an appeal, the party against whom the sessions decide frequently applies for leave to state a special case for the decision of the Court of King's Bench. The majority of the justices may either grant or reject the application; and if no special case be stated, the judgment of the quarter-sessions upon an appeal, or upon any other matter in which they proceed in a course prescribed by statute, different from the course of the common law, cannot be reviewed by any other court.

4. The quarter-sessions have jurisdiction over the appropriation of the county stock, an annual fund raised principally by county rates.

5. In common with other courts of record, justices of the peace, whether assembled in sessions, or sitting as individual magistrates, may fine and imprison for contempt. No superior court can inquire into the existence or non-existence of the fact which has been so treated as a contempt, or into the reasonableness of the fine imposed or imprisonment awarded.

The justices being assembled in sessions elect a chairman. The chairman delivers his charge to the grand-jury, in which, as he is in possession of the depositions taken when the prisoners were

committed, he calls their attention to such cases as appear to present any difficulty, and explains such points of law as are necessary for their guidance. The grand-jury then retire to their room to receive such bills of indictment as may be brought before them.

When the business of the sessions is such as to be likely to occupy one court more than three days, it is usual to appoint a second chairman to preside in a separate court, under the authority of 59 Geo. III., c. 28. The bills of indictment for offences to be prosecuted at the sessions being prepared, the witnesses in support of the charge are sworn in court. The bills of indictment on parchment, with the names of the witnesses endorsed thereon, are taken to the grand-jury.

The bill, being endorsed by the grand-jury, is brought into court by the grand-jury, and delivered to the clerk of the peace, who reads the endorsement with the name of the prisoner and the nature of the charge. The prisoner is then arraigned, and the trial proceeds in the same manner as at the assizes. If a verdict of guilty be returned, the sentence is pronounced by the chairman, such sentence, where the amount of punishment attached to the offence is not fixed, being first determined by the opinion of the majority of the justices present.

The sessions cannot be held without the presence of two justices. Every act done as an act of sessions, before two justices have met, or after two have ceased to be present, is void.

Petty and Special Sessions.—A meeting held by justices for the transaction of magisterial business arising within a particular district which forms a subdivision of the county or district comprised in the commission of the peace, is called a Petty Session; and if the meeting be convened for some particular or special object, as the appointment of overseers of the poor, of waywardens, of examiners of weights and measures, &c., it is called a Special Session. A meeting of magistrates cannot legally act as a special session, unless all the magistrates of the particular division are present, or have had reasonable notice to attend.

Borough Sessions.—The Municipal Corporation Act (5 & 6 Wm. IV., c. 76) directs that the recorder of any city or borough to which a separate court of quarter-sessions is granted under the provisions of that act, shall be the sole judge of such court, leaving the ordinary duties of magistrates out of sessions to be performed by the justices of the peace appointed by the crown for such city or borough. The recorder is required to hold a court of quarter-sessions once in every quarter of a year, or at such other and more frequent times as he may think fit, or as the crown may direct. Borough quarter-sessions are not, however, like county quarter-sessions, appointed to be held in particular weeks.

Every burgess of a borough (or citizen of a city) having a court of quarter-sessions (unless exempt or disqualified otherwise than in respect of property), is liable to serve on grand and petty juries. Members of the town-council, and the justices of the peace, treasurer, and town-clerk of the borough, are exempt and disqualified from serving on juries within the borough; and they and all burgesses of boroughs having separate quarter-sessions are exempt from liability to serve on petty juries at the county sessions.

Other matters required by statute to be done at quarter-sessions, and not expressly transferred to the town-council, devolve upon the recorder, as the appointment of inspectors of weights and measures, &c. Persons imprisoned in a borough gaol by county magistrates, under 6 & 7 Will. IV., cap. 105, may be tried at the borough sessions for offences committed out of the borough.

All criminal jurisdiction, which, before the passing of the Municipal Corporation Act, existed in any borough to which no court of quarter-sessions has since been granted, is taken away by the 107th section of that act.

SESTE'RTIUS, a Roman coin, which originally consisted of $2\frac{1}{2}$ asses, as the name implies, *sestertius* being a contraction of *semis tertius, the third a half,* which is the Roman way of expressing *two and a half.* The sestertius belonged both to the brass and silver coinage; and in both it was of the same value, namely, one-fourth of the denarius. This value agreed with its value in asses so long as the denarius consisted of 10 asses. But at an early period the as was reduced in value, and 16 asses made equal to the denarius, and then the sestertius, its value with reference to the denarius remaining the same, became of course equal to 4 asses. On Mr. Hussey's computation the value of the denarius after the reduction was $8\frac{1}{4}d.$, and therefore the sestertius was worth $2\frac{1}{8}d.$ After the time of Augustus the denarius was reduced to the eighth of an ounce, and was worth $7\frac{1}{2}d.$, and therefore the sestertius was worth $1\frac{7}{8}d.$ The sestertius of the brass coinage was made of the same metal as the as.

The Romans generally reckoned sums of money in sestertii, although the coin used in making payments was commonly the denarius. As to the mode of reckoning, see the article 'Sestertius,' in the 'Penny Cyclopædia,' and in Smith's 'Dictionary of Greek and Roman Antiquities.' The Roman symbol for sestertius is HS, or properly IIS, that is two units and a half (semis).

SESTI'NI, DOME'NICO, born at Florence about 1750, studied classical literature, and applied himself chiefly to archæology. About 1774 he went to Sicily, where the Prince of Biscari retained him for his librarian and keeper of his rich cabinet of antiquities at Catania. In 1778 Sestini proceeded to Constantinople, where he became tutor to the sons of Count Ludolfi, the Neapolitan ambassador at the Porte. He made several journeys with his pupils through various provinces of the Ottoman Empire. He was afterwards employed by Sir Robert Ainslie, the English ambassador at the Porte, to collect medals for him. Subsequently he went with Mr. Sullivan as far as Bushire, and returned to Consantinople in 1782. On his return to Italy he published several of his works. The rest of his life was spent in journeys and in residing at various places in pursuit of his numismatic studies. Sestini died at Florence in 1832. His numerous works consist

of many volumes of travels, and his works on Numismatics, a branch of learning in which he holds the highest place. A list of his principal works is given in the 'Penny Cyclopædia,' article 'Sestini.'

SESTOS. [ABYDOS.]

SESTRI. [GENOA.]

SET-OFF is the amount of the debt due to a defendant from a plaintiff, which the defendant is entitled to set-off in answer either to the whole or part, as the case may be, of the plaintiff's demand. The law of set-off is now founded on two statutes, 2 Geo. II. c. 22, and 8 Geo. II. c. 24, s. 4. A defendant may avail himself of his set-off in actions of debt, covenant, and assumpsit for the non-payment of money, provided the subject-matter of the set-off is a liquidated, that is, an ascertained sum, due and recoverable at the time of the commencement of the action, and might have been the subject of any one of the kind of actions above named. The Bankrupt Act (6 Geo. IV. c. 16, s. 50) provides for cases where there are mutual debts between a bankrupt and other persons. The principle of set-off was established among the Romans, and is expressed by the term 'compensatio.' ('Dig.' 16, tit. 2.) In Scotch law it is called 'compensation.'

SETA'RIA, a genus of grasses containing a few species cultivated as corn-grains in some countries. The species are found both in the hot and temperate parts of the world. Two are indigenous in England, *S. verticellata* and *S. viridis*, and called Bristle-Grass. The first is found also in India and America. Birds are fond of the seed of the latter. *S. Germanica* is cultivated in Hungary as food for horses, and is preferred for this purpose to many other grasses. *S. Italica* is cultivated in Italy and other parts of Europe, sometimes called Millet (*Panicum miliaceum*), and employed for the same purposes.

SETTER, the name for that variety of the Dog which partakes of the character of the POINTER and SPANIEL, *Canis familiaris index* of Caius.

The Setter is less liable to be foot-sore than the Pointer; but is generally considered more difficult to break. When however a well-broken well-bred Setter is hunted frequently, no dog trained to the gun does his work better or is more staunch. The breed originated in all probability between the large English spaniel and the Spanish pointer. This variety possesses a high degree of intelligence, and is capable of the strongest attachment.

SETTLE. [YORKSHIRE.]

SETTLE, ELKANAH, was born in 1648, at Dunstable, and was entered a commoner of Trinity College, Oxford, in 1666, but left the university without a degree, and came to London as a literary adventurer. He first rose into reputation in 1671, by the success of his tragedy of 'Cambyses,' and the Earl of Rochester, desirous to humble Dryden, adopted the new dramatist as his instrument. Settle's next tragedy, 'The Empress of Morocco,' enjoyed the honour of being acted at Whitehall by the lords and ladies of the court, and the author, intoxicated by his undeserved success, prefixed to it a vaunting preface, animadverting severely upon Dryden. Dryden now assisted Shadwell and Crowne in writing scurrilous 'Notes and Observations' on the play, which the author answered in the same strain. Settle's fame was short-lived; and Dryden had little cause to fear him when he was so ill-advised as to advocate the cause of his whig patrons, by publishing, in answer to the 'Absalom and Achitophel,' a poem entitled 'Absalom Senior, or Achitophel Transposed.' Nevertheless, the new offence was thought worthy of punishment; and under the name of Doeg, Elkanah was gibbeted in the second part of 'Absalom and Achitophel.' Down to this time Settle had been a trusted servant and pamphleteer of Shaftesbury and the other whig leaders; and in November, 1680, he superintended the burning of the pope in effigy. Soon afterwards however he changed his party. By this change he preserved his place as poet laureate for the city, and writer of verses for pageants and other civic festivities; but with the revolution his prospects were completely blighted. Although he retained his place as city-poet, he was reduced to great poverty. At length, in his desolate old age, he was received into the Charter-house, and died there in 1723. He was the author of sixteen plays which were printed, and of many occasional and political pieces both in verse and in prose.

SETTLEMENT. A settlement, in the most general sense of the word, is a disposition of property of any kind made for certain purposes by the owner, who, in relation to such disposition, is called the settlor or grantor. A settlement in this sense may be made either by deed or by will; but the term is most commonly applied to such settlements only as are made by a deed. A consideration is not necessary for the validity of a deed at law. Though a deed may in many cases be void as against strangers for want of consideration, it is valid as between the parties. Settlements by deed therefore may be either made upon valuable or good consideration, or they may be purely voluntary.

The most important species of settlements, to which indeed, in strict legal language, the term is exclusively applied, are Marriage Settlements; and these may be either such as are made previous to and in consideration of marriage, or subsequent to it.

Settlements of property are frequently made by will, with reference to an existing or future marriage. The forms and provisions contained in such instruments are of course often very similar to those in deeds made for like purposes. But dispositions of this kind are to be regarded in all respects as wills, and are governed by the same rules as other instruments of the like nature.

Settlements in consideration of marriage include not only such as are actually made and executed before marriage, but also such as are executed after marriage in pursuance of articles in writing drawn up and signed before marriage.

The specific performance of articles and agreements to settle property will be enforced by a court of equity, conformably to the rules and with the exceptions that have been established by the practice of such courts.

Marriage being a valuable consideration, as it is termed, the circumstance of the settlor being indebted, or even insolvent, at the time of the execution of the settlement, has no effect on its validity, even though the persons who have the benefit of the settlement should have full notice of such insolvency. A conveyance or assignment of property in consideration of marriage stands on the same ground with a sale for money, which is not affected by the insolvency of the vendor. If however the settlor be a trader, and a fiat in bankruptcy has issued against him prior to the execution of the settlement upon which he is afterwards duly found a bankrupt, such settlement, like all other conveyances of the bankrupt under the same circumstances, will be void; and it would seem that a settlement must in all cases be void as respects the wife, if she had notice of a prior act of bankruptcy, and a fiat issues within twelve calendar months after such act of bankruptcy. (2 & 3 Vict., c. 29, and 2 & 3 Vict., c. 11, s. 13.)

The marriage consideration does not extend or give the character of purchasers to all persons in whose favour limitations may have been introduced into the settlement. In relation to any other persons than the husband and wife and the issue, the settlement is, it seems, to be considered as voluntary, and subject therefore to the rules applicable to voluntary gifts and covenants.

Settlements made after marriage, it is obvious, can derive no support from the consideration of marriage, and their validity or invalidity must therefore depend upon other circumstances. For the law on this subject, it is necessary to consult technical treatises.

Secret settlements of her property made by the wife pending the treaty for marriage, without the privity of the husband, are void as against him, if made in derogation of his marital rights; and this, it seems, is equally true, whether the husband knew of the existence of the property before the marriage or not. The rule applies to every species of gratuitous incumbrance created by the wife upon her property under such circumstances.

The courts of equity, upon the general principles on which they act in cases of fraud, will set aside all secret covenants or agreements entered into contrary to the good faith of the marriage treaty, and not with the privity of all the parties to the settlement.

Settlements of real property usually consist of limitations of an estate or estates for life to one or more persons *i. e.* (where the settlement is made on marriage), to one or both parents and the survivor of them, with remainders over to their children. The effect of the settlement is to render the estate inalienable till the eldest son of the marriage attains the age of twenty-one, when he can join with his father in barring his own estate tail and all the remainders over, whereby a new estate in fee-simple is acquired, and the property may be settled again. This is now effected by a deed executed under the provisions of the 3 & 4 Wm. IV. s. 74. This act abolished fines and recoveries, and the objects of these old modes of assurance are now obtained by a deed which must be enrolled in Chancery within six months after its execution. The estates limited in settlements of real property may be either legal or equitable.

Estates for lives and terms of years are incapable of being entailed; but they, as well as personal property of any kind, may be settled in trust as effectually, and so as to be inalienable for as long a time as estates of inheritance. The property in such settlements is usually assigned to trustees in trust for the husband, or for the husband and wife for his or their life or lives and the life of the survivor; and then in trust for the first and other sons severally, and the heirs of their bodies.

There is no restriction as to the number of life estates which may be limited in settlements to take effect in succession, provided the persons be all in existence at the date of the settlement; for, in point of fact, this amounts to no more than an estate for the life of the survivor.

Thus it appears that real or personal property may be settled so as to be inalienable for a life or any number of lives in being, and twenty-one years after. To this must be added a period of nine months, which is allowed for the birth of a posthumous child in cases where gestation exists. All restraints on alienation beyond the above-mentioned limits are void, as tending to what is called in law a perpetuity; and all the subsequent limitations, if contingent, are also void. The same rules are applicable to executory devises, and springing and shifting uses; but not to remainders limited to take effect after estates tail, which are not subject to any restriction; because as such limitations may be defeated at any time by barring the estates tail, they can have no tendency to a perpetuity.

Questions frequently arise as to what powers, covenants, and provisos are to be introduced into marriage settlements made in pursuance of executory trusts, whether created by articles, wills, or other instruments. The determination of these depends entirely upon the rules of construction as applied to each particular case.

Of the powers usually introduced into settlements of real estate, the most important are—powers of jointuring and raising portions; powers of leasing and management; and powers of sale and exchange.

Marriage is not an absolute gift to the husband of the wife's personal estate, but only entitles him to so much of it as he may have reduced into possession, assigned or released during his lifetime. Accordingly, questions frequently arise upon settlements as to the title of the husband, under them, to the whole of his wife's fortune. Upon this point the following propositions appear to be established:—1. The antenuptial settlement of property made by the husband upon the wife, in consideration of her fortune, entitles him only to her *then*, and not to the *future* personal property; 2, that if a part only of her fortune appears to have been stipulated for, the residue of what she then has, or what may afterwards accrue to her, will not belong to the husband; 3, that when it appears from the settlement, either expressly or by implication, that the agreement was for the whole of the wife's present and future personal estate, the husband, or his personal repre-

sentative (in case of his predeceasing his wife), will be entitled to claim the whole under the contract.

When the husband has not entitled himself by contract to the choses in action of the wife, there is no bar to his getting possession of such of them as are recoverable at law; but if he require the assistance of a Court of Equity for the recovery of them, and the wife does not consent to his obtaining the whole, that court will not lend its aid, except upon the terms of the husband's making a provision for the wife and her children, by way of settlement, out of the fund. Most frequently one half of the fund is directed to be settled, but the proportion given in each case depends upon the circumstances, though it never amounts to the whole. The rules of the Court of Equity in directing settlements out of the wife's equitable choses in action are the same, whether the application to it is made by the husband himself or by his creditors. Settlements out of the wife's equitable choses in action, when made by the husband, are no less valid against his creditors than when made under the direction of the court; and even a settlement by him of the entire fund, which the court would not have directed, has in some cases been held valid against his creditors; though the decisions in those cases seem hardly consistent with the law as laid down under the 13 Eliz., c. 5.

(Separate Use; Cruise, *Digest*, vol. iv.; Roper *On Husband and Wife*; Martin's *Conveyancing*, by Davidson, vol. i., art. 'Settlement.')

SETTLEMENT. [Poor Laws.]

SETUBAL. [Estremadura, *Portuguese*.]

SEURRE. [Côte-d'Or.]

SEVAJEE, surnamed *Bosla*, the founder of the Mahratta power in India, was born in May, 1627, at Poonah, the 'jagheer,' or fief, of which was held by his father Shahjee, under the kingdom of Ahmednuggur, and, after its dissolution, from the Bejapoor monarchy. In 1647 he had supplanted his father at Poonah, and in the following year possessed himself of all the Northern Concan. The Bejapoor government was then fully occupied in guarding against the aggressions of the Moguls of Delhi: and Sevajee continued for several years to extend his power by progressive encroachments without coming to an open rupture, till his spoliations became so daring that in 1658 a large force was sent against him. He maintained himself in the field till 1662, when a peace with the Raja of Bejapoor left him in possession of his acquisitions. But he now came into collision with the formidable power of Aurungzebe, with whose armies in the Deccan he was unable to cope; and though he succeeded by a sudden irruption (January, 1664) in surprising and sacking Surat, from which he brought off an immense booty, he found it expedient in the following year to make his submission to the Emperor of Delhi, and co-operating with the Mogul troops in their invasion of Bejapoor, did distinguished service in the campaign. He was disgusted however by the haughty reception which he met with at the court of Delhi; and having made his escape with difficulty from the capital, he re-occupied his former territories, which he greatly enlarged at the expense of the falling kingdoms of Bejapoor and Golconda, avoiding for some years to renew hostilities with the Moguls. This interval he employed in settling his dominions, and introducing a strict system of discipline into his army; and when the war with Aurungzebe broke out anew (1670), he not only ravaged the country with his light cavalry, and inflicted a second sack on Surat, but in 1672 for the first time engaged and defeated a regular Mogul force in a pitched battle. To this period is also assigned the commencement of the 'chout,' a sort of tribute, consisting of the fourth of the revenue, on the payment of which any province was exempted from devastation, and which long continued a principal source of Mahratta revenue.

He had for several years previous assumed the title of Raja, and the royal prerogative of coining money; but in 1674 he was solemnly crowned at Rayghur, with all the pomp of the Mogul ceremonial, signalising his accession by an inroad in which he for the first time carried his arms north of the Nerbudda. His next exploit was in a different direction: having secured his rear by an alliance with Golconda, he boldly crossed the peninsula (1676) to the eastern coast, possessed himself of Vellore and other strong forts between Madras and Pondicherry, and overran great part of Mysore, to which he laid claim from his father Shahjee having held a jagheer there at the end of his life. From these conquests he was recalled (1678) by the invasion of Golconda by the Moguls; and though his plans were for a time disconcerted by the desertion of his son Sambajee to the enemy, he compelled Aurungzebe's viceroy of the Deccan to retire from Golconda, and to raise the siege of Bejapoor, while he exacted from the latter state, as the price of his aid, the cession of all the country between the Toombuddra and the Kishna. His power was now predominant throughout Southern India, none of the shattered sovereignties of which were able to oppose any check to his progress; but his further schemes of aggrandisement were cut short by a sudden illness, of which he died April 5, 1680, aged nearly fifty-three. His son Sambajee (who had previously resumed his allegiance) succeeded him; but neither his abilities nor his fortune were equal to those of his father, and he was taken and put to death in 1689.

SEVASTOPOL. [Sebastopol.]

SEVENOAKS. [Kent.]

SEVENTH, in Music, a dissonant interval, of which there are three kinds—the minor or ordinary seventh, from G to F; the diminished seventh, from C sharp to B flat; and the major or sharp seventh, from C to B.

SEVER, ST. [Landes.]

SEVERAC-LE-CHATEAU. [Aveyron.]

SEVERN AND WYE. The Severn is the finest, and, next to the Thames, the largest and most important of British rivers. The river Wye is its chief tributary.

The Severn rises on the western border of Montgomeryshire, from a chalybeate spring on the eastern side of Plinlimmon, at a very considerable elevation. It flows eastward about 12 miles to Llanidloes, as far as which place it still retains

the original British name of Hafren. After flowing N.N.E. about 51 miles by Newtown and Welshpool, it quits Montgomeryshire and enters Shropshire, flowing E. to Shrewsbury, and then S.E. to Coalbrook Dale and Bridgenorth. It enters Worcestershire near Bewdley, and flows nearly S. past Stourport, Worcester, Upton, and Tewkesbury, where it enters Gloucestershire, and flowing nearly S.S.W. to Gloucester, it branches into the two channels which inclose Alney Island; and thence past Newhaven to Bristol, where it receives the Lower Avon, and enters the Bristol Channel by a wide æstuary. The Severn receives the whole of the waters of the interior of Shropshire, and its course through that country is between 60 and 70 miles. The total length of the Severn, from its source in Montgomeryshire to the Bristol Channel, is about 200 miles.

In respect to navigation, the Severn has long been of very great importance. It supplies the means of transporting the produce of mines and manufactories of various descriptions lying in the vicinity of the river to the sea, to North Wales, and the towns and remote districts of the counties through which it flows. It is an extremely important commercial river to Shrewsbury, Worcester, Gloucester, and Bristol. Vessels of 110 tons can ascend to Gloucester; those of 80 may go to Worcester; of 60, as far as Bewdley Bridge, and those of 30 tons may ascend to Coalbrook Dale. The commercial importance of the Severn has been much increased by its connection with several canals.

The *Wye* has its rise on the border of Montgomeryshire, and on the mountain of Plinlimmon, about 2 miles S.W. from the source of the Severn. The Wye flows S.S.E. past Rhayader and Builth. Near Talgarth it turns E. by N. and flows past Hay, and then E. by S. to Hereford, whence it flows nearly S. past Ross, Monmouth, and Chepstow, where the river is crossed by a massive iron bridge, and about 2½ miles S.W. of that town the Wye falls into the æstuary of the Severn. The whole course of the Wye is very beautiful. The river is navigable for barges up to Hereford. At Brook's Weir, between Redbrook and Tintern, the stream is met by the tide, and up to this point vessels of 90 tons can reach. The length of the course of the Wye is about 130 miles. Owing to the isthmus or neck of land above the mouth of the Wye, and the projection of Aust Cliff on the opposite shore, the width of the Severn is here only one mile, while higher up it expands to between two and three miles.

The æstuary of the Severn receives the drainage of about 5900 square miles, viz. the Severn, 4500; the Wye, 1400.

The Severn is charged with a larger relative amount of turbid sediment than any other river in Europe; the result of its own long course and of those of its tributaries through tracts of marl and soft sandstone. This fine sediment is in some places deposited on its banks towards the mouth, and the quantity thus deposited is increased by artificial means. The mud is encouraged to accumulate upon lines of pile and osier, which, as the tide retreats, retain the sediment. Upon these, other lines of osier-fencing are placed, until the new land is raised to a considerable height.

SEVE'RUS, MARCUS AURELIUS ALEXANDER, was the son of Julia Mammæa, the sister of Soemis, who was the mother of Elagabálus. He was born in Phœnicia, A.D. 208, and at an early age was brought to Rome. In his education his mother showed great care and discretion. On the death of Elagabálus, Alexander was made emperor, A.D. 222. His reign may rather be called the regency of his mother, who conducted the chief business of government with great discretion. She selected a council of sixteen from the senate for her ministry, and appointed the jurist Ulpian præfect of the Prætorian guard. Under her guidance Alexander led a life of strict morality, applying himself closely to the business of the state, and in his leisure hours to literature.

The attempts of the empress-mother to reform the dissolute army were frustrated by their turbulent spirit. The Prætorian guards revolted and murdered Ulpian. In the latter part of his reign (about 231 A.D.) Alexander undertook an expedition against Artaxerxes, the founder of the dynasty of the Sassánidæ. The particulars of this war are obscure, but it appears that the campaign was without glory to the Roman army, and Alexander retreated to Antioch. (Herodian, iv. 13.) The emperor was shortly afterwards roused from a state of luxurious inactivity by the news of a revolt of the Germans, who had passed their boundaries. He proceeded to quell this insurrection in person, but having recourse to bribery to buy off the rebels, he incurred the contempt of the troops. This feeling was fostered into mutiny by the arts of Maximinus, and the result was a sedition, in which Alexander and his mother were both killed at a place called Sicilia in Gaul, A.D. 235.

Head of Alexander Severus. British Museum. Brass.

SEVE'RUS, L. SEPTI'MIUS, was a native of Leptis in Africa, where he was born, A.D. 146, of an equestrian family.

After his eighteenth year Severus came to Rome for his improvement. He studied law with Papinian, who was a relation of his second wife, under Q. Cervidius Scævola; and he received from M. Aurelius the office of advocatus fisci, in which he was succeeded by Papinian. After the death of Aurelius, he visited Athens; and when he became emperor, he showed the citizens that he had not forgotten certain slights put upon him during his residence there. Under Commodus he held the office of legatus of the Lugdunensis Pro-

vincia. On losing his wife Marcia, he looked out for another whose nativity was favourable to his ambitious views; for Severus appears to have been a believer in astrology. He heard of a woman in Syria whose destiny it was to marry a king, and accordingly he solicited and obtained in marriage for his second wife Julia Domna, by whom he had children.

Severus was at the head of the army in Germany when news came of the death of Commodus, which was followed by the short reign of Pertinax, and the accession of Didius Julianus. The army proclaimed Severus emperor, and saluted him by the name of Pertinax, as Herodian states; and the fact is confirmed by the medals of Severus. While he was advancing upon Rome, Julianus was murdered in his palace, and Severus entered the city with his soldiers (A.D. 193), when he was acknowledged emperor.

But Severus had a formidable rival in the East, where the legions had proclaimed Pescennius Niger. After arranging affairs at Rome, he set out to oppose Niger, whom he defeated near Cyzicus. He also advanced into the sandy plains of Mesopotamia, in order to secure the empire on that side and to punish the adherents of Niger. The Parthians and Adiabeni were reduced, and Severus was honoured with the titles of Arabicus, Adiabenicus, and Parthicus, by the senate.

On his road to Rome Severus heard of the revolt of Albinus in Gaul, and he directed his march to that province. After the war had been carried on for some time with various success, a great battle was fought near Lyon, in which Albinus was defeated and lost his life. Severus ordered the head of Albinus to be cut off before he was quite dead, and he made his horse trample the body under his feet. Even the wife and children of Albinus, according to some accounts, were put to death, and their bodies thrown into the Rhone. Numerous partizans of Albinus were put to death, both men and women, whose property enriched the ærarium.

The restless temper of the emperor led him again into the East. From Syria he marched against the Parthians, and took Ctésiphon, their capital. From Parthia he returned to Syria, from which country he marched through Palestine to Alexandria in Egypt. He made many changes in the institutions of Judæa, and forbade under severe penalties the making of Jewish converts. He gave the Alexandrines a kind of senate (jus buleutarum), and after making many changes in their institutions, returned to Rome A.D. 203. He declined the honour of a triumph which was offered to him, but his victory was commemorated by the erection of a triumphal arch, which still bears his name.

In A.D. 208, Severus, with his two sons, Caracalla and Geta, set out on their British campaign. Geta was left with an army in the command of South Britain, and the emperor undertook the campaign against the Caledonians, with his son Caracalla. He made his way with great difficulty through a country covered with forests and without roads, and the Roman army sustained great loss. Severus attempted to secure the limit of his conquests by constructing the great rampart, which is known by the name of the Wall of Severus, which extended from the Solway Frith to the mouth of the Tyne.

The last days of Severus were embittered by the dissensions of his sons, and more particularly by the undutiful conduct of Caracalla. He died at York (Eboracum) A.D. 211, in the eighteenth year of his reign, leaving only two children, Geta, and Caracalla. His body, or, according to other accounts, the urn which contained his ashes, was carried to Rome, and placed in the tomb of the Antonini.

This Roman emperor was a man of uncommon vigour of character, a skilful general, a good lawyer, and a man of letters; he was plain in his mode of life, a rewarder of merit, and a lover of justice; but his great qualities were sullied by cruelty.

Head of Septimius Severus.

Commemoration of the celebration of the Ludi Saeculares.
British Museum. Actual Size.

SEVERUS'S WALL. [BRITANNIA.]

SE'VIGNE', MADAME DE. *Marie de Rabutin Chantal* was born, according to her own account, Feb. 5, 1627, apparently at the château of Boubilly in Burgundy; and being left an orphan at an early age, the charge of her education fell into the hands of an uncle, the Abbé de Coulânges, an excellent and judicious person. Possessed of personal beauty and considerable fortune, she married, Aug. 1, 1644, the Marquis de Sévigné. This connection did not prove happy; it was dissolved in 1651, by the death of her husband in a duel, leaving her with a dilapidated fortune and the charge of a son and daughter. These children were throughout life her chief care, and especially her daughter, to her affection for whom we owe the greater part of that collection of letters upon which the fame of Madame de Sévigné

is raised. Madame de Sévigné died, after a few days' illness, at the town of Grignan, in 1696.

As a letter-writer she has the highest merit. Unstudied, and not always correct, she possessed a natural eloquence, an ease and liveliness of expression, which will never cease to attract.

The most complete collection of the letters is that of M. de Monmerque, Paris, 1818, 11 vols. 8vo., and 13 vols. 12mo.

SEVILLE, the capital of Andalucia in Spain, is situated in a plain on the banks of the Guadalquivir, in 37° 24′ N. lat., 5° 48′ W. long., at a distance of 237 miles S.S.W. from Madrid, and has about 91,000 inhabitants. The city supposed to be of Phœnician or Carthaginian origin; its Phœnician name was *Spali* or *Sephala*, which is said to mean a plain. Of this word, the Romans and Greeks made *Ispalis* or *Hispalis*; the Arabs *Ishbilia*, and modern Spaniards *Sevilla*. Under the Romans it became a Roman colony, and was called 'Colonia Julia Romula.' In 712 Seville opened its gates to the Arabs, who made it the seat of their empire, until the foundation of the western Kalifate at Cordova in 756. From this period Seville continued to be the second Moorish city in Spain until the year 1031, when on the overthrow of the Umeyyan Kalifs of Cordova Seville became the capital of a separate kingdom. After Nov. 23, 1248, on which day the city was taken after a fifteen months' siege by Ferdinand III., Seville belonged to the kings of Castile.

The city is almost circular, and the circuit is about 6 miles. It is surrounded by walls partly of Roman, partly of Moorish construction, flanked by numerous towers, and pierced by fifteen gates, outside of which are several suburbs. The streets are crooked, ill paved, and exceedingly narrow. The city however contains several fine squares. The houses are perhaps the most picturesque in the world. They have generally a large paved court, ornamented with running fountains, flowers, &c., and surrounded by marble columns supporting galleries or rooms above. In the summer a canvas awning is thrown over the whole court during the heat of the day, and removed at night, and there the family usually sit to receive their visitors. The public walks in Seville are much admired.

Seville contains many remarkable buildings—La-Torre-del-Oro, in which the gold brought from America used to be deposited; La Lonja (Exchange), a magnificent building, erected by Philip II. in 1523, over which are the archives of the colonies; the Casa-de-Pilatos, or palace belonging to the dukes of Alcala; the Town-Hall; the naval college of San-Telmo; the cannon-foundry; the tobacco factory, an immense building, 600 feet in length by nearly 500 in breadth; and the famous aqueduct, built or repaired by the Moors.

The cathedral was founded in the year 1401, on the site of the ancient mosque, but was not completed until 1519. Externally it presents a mixture of Arabian, Gothic, and Greco-Roman architecture; but its general appearance is very imposing. The interior, which is exclusively Gothic, is rich and grand. Its dimensions are 398 feet by 291. Four rows of enormous clustered columns, eight in each row, separate the aisles. The roof of the centre nave and transept is 134 feet above the pavement; at the transept dome the height is 145 feet; the roof of the side aisles is 96 feet high. The centre aisle contains the choir and the grand altar. Above the choir, which is separated from the body of the church by a lofty and richly-worked screen, is the organ, which contains 5300 pipes with 110 stops. The high altar is ornamented with the richest marbles, paintings, statues, and a profusion of gilding. The chapels, in all about 26, contain many treasures of art, paintings, statues, and exquisite carvings, by the best masters of the Sevilian school. Behind the high altar is the Capilla Real, which contains the tomb of Ferdinand III.

The Giralda, a lofty square tower of Arabian architecture, which originally formed part of the ancient mosque, serves now as a belfry to the cathedral. It was built in 1160, and was originally only 250 feet high; but in 1568 it was raised 100 feet higher. On the top was placed a statue of Faith, of gilt bronze, which, though 14 feet high, and of the enormous weight of 3600 lbs., turns (gira) on a pivot and acts as a weathercock, thus giving the name 'Giralda' to the tower. This tower and the court of the orange-trees are the only remains of the ancient Moorish mosque. Attached to the cathedral is a very valuable library, founded by Ferdinand Columbus, who is buried in the cathedral. During the Peninsular War the sacred vessels of the cathedral were removed to Cadiz, in order to save them from the French. Seville has also 28 parish churches, and a great number of convents. The convent of La Merced, founded by Ferdinand in 1249, is one of the most remarkable for its size and architecture. The hospitals of La Sangre and La Caridad are very fine buildings. But the edifice which, after the cathedral, most attracts the attention of travellers is the Alcazar, or Moorish royal palace, which, though modernised, still preserves much of its original beauty, especially in the Hall of Ambassadors. The gardens which surround the palace are very beautiful.

Seville is the see of an archbishop. It has a university, founded in 1502; an academy of painting, sculpture, and architecture; and several literary and scientific establishments. The trade which has greatly declined since Spain lost her American colonies, is chiefly in oil, wine, corn, hemp, flax, liquorice, lemons, and oranges. Steamers ply regularly between Seville and Cadiz. Vessels of 100 tons can come up to the town.

SEVRES, DEUX, a department in France, formed out of Upper Poitou, and named from its two chief rivers, is bounded N. by Maine-et-Loire, E. by the department of Vienne, S. by those of Charente and Charente-Inférieure, and W. by Vendée. Its greatest length is 79 miles, its greatest breadth 42 miles. The area is 2345 square miles, and the population in 1846 was 320,685, which gives 136.75 to the square mile, being 37.0 below the average per square mile for the whole of France.

A chain of low granitic hills, which forms the continuation of the Limousin mountains and nowhere exceeds 440 feet in height, crosses the department from S.E. to N.W., dividing it into two slopes, of which the northern belongs to the basin of the Loire, while the southern one forms part of the independent basin of the Sèvre-Niortaise, but comprises also a portion of the basin of the Charente. From the source of the Sèvre-Niortaise this range forms a broad and in many parts bare and rocky table land, called Gâtine, which covers two-thirds of the surface of the department; it abounds in ponds, each forming a river-head, and where it is joined on its eastern and western edges by calcareous strata, the surface is in many places rent by gorges and ravines. The east of the department presents numerous valleys, shut in by lateral branches from the main range, and opening into the valley of the Thouet, a feeder of the Loire. There are plains of considerable extent in the south-west of the department. The soil in the Gâtine is ill fitted for agriculture, being poor, cold, and wet; it is covered in many places with forests, mostly of stunted shrubs and evergreens, and abounds in pasture. In the plains and valleys of the south-west of the department the soil is excellent, but farming is in a backward state.

The south-west of the department is drained by the Sèvre-Niortaise, which rises a little north of the town of Melle, runs in a general western direction past Niort, separating in its lower course the departments of Vendée and Charente-Inférieure, and falls into the sea opposite to the Isle of Ré. It has been rendered navigable for barges from Niort, but with great difficulty, for below this town the river divides into several branches, flowing through a marshy alluvial soil, which occasionally encroaches on the navigable channel, and alters its course. The several branches unite at Marans, whence to the sea there is tide navigation for vessels of 100 tons. [CHARENTE-INFÉRIEURE.] The principal feeders of the Sèvre-Niortaise are the Autise, the Vendée, on the right bank, and the Mignon on the left. The Boutonne, a feeder of the Charente, rises near the source of the Sèvre-Niortaise, and drains the south of the department. The northern districts are drained by the Thouet, a feeder of the Loire, which receives the numerous streams that flow from the north-eastern slope of the Gâtine; and by the Sèvre-Nantaise, which rises west of Parthenay, near the sources of the Thouet and the Autise, flows along the western side of the Gâtine, through the north-east of the department of Vendée, and enters the Loire opposite the city of Nantes, in Loire-Inférieure. A canal is in course of construction from the Sèvre-Niortaise midway between Niort and Marans to La-Rochelle; several short canals enter the same river in the lower part of its course, and serve to drain some of the marsh-land along its banks. The department is traversed by 6 national, 9 departmental, and 5 military roads.

The climate in the plains is warm and genial; in the Gâtine the winters are longer and colder than those of Paris, and in summer thick fogs are very frequent.

The agricultural products include the common cereal grains, with buckwheat, maize, millet, mustard, pulse, clover seed, nuts of various kinds, almonds, chestnuts, hops, a little hemp, and fruits. The vineyards are chiefly in the south of the department, but there are a few also in the neighbourhood of Thouars; they yield 7,700,000 gallons of wine annually, the greater part of which is made into brandy and vinegar. Great numbers of cattle are bred, and the department is famous for its mules and asses, in which the trade is considerable. Sheep and pigs are numerous. Geese, ducks, turkeys, and game are very abundant.

Iron is found at various points, and there is coal on the confines of Vendée. Antimony, flesh-coloured marble, building stone, quartz, millstone grit, flint, and marl are found. Calcedony is found in the neighbourhood of Niort, and fossils abound in the calcareous strata that skirt the western side of the granitic rocks of the Gâtine.

The principal manufacture is that of glove and shoe leather, which is carried on in the environs of Niort, whence a considerable quantity of shoes are exported. Oil, vinegar, brandy, pottery, common woollen cloth, cotton and woollen yarn, iron, and paper are also made. The commerce in agricultural produce is considerable. About 500 fairs are held in the year.

The surface measures 1,500,851 acres, distributed among 132,018 proprietors, and into 1,438,784 parcels. Of the whole area, 999,219 acres are arable land; 185,219 grass and meadow land; 113,205 wood and forest; 56,327 heath and moorland; 51,629 acres are occupied with vineyards; 23,908 with gardens, orchards, and nurseries; 2548 with various culture; 10,356 with rivers, lakes, ponds, and marshes; 47,288 with roads, streets, and squares; and 11,135 with buildings, &c.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Niort . . .	10	95	105,365
Bressuire . .	6	91	67,747
Melle . . .	7	98	78,063
Parthenay . .	8	75	69,510
Total . .	31	359	320,685

The arrondissement of Niort is named from its chief town NIORT, which is also the capital of the department. *Coulonges*, a town of 2000 inhabitants, is important for its corn market, and as being an entrepôt for the wines of Saintonge, and the timber and oakstaves of Gâtine. It is situated in a fertile district, 15 miles N.N.W. from Niort, not far from the right bank of the Autise. *St.-Maixent*, a wretchedly-built town, is situated 14 miles N.E. from Niort, on the slope of a hill above the Sèvre-Niortaise, which is here passed on a handsome bridge. In the environs of the town, which are very fertile, there is a series of cascades formed by a jet of water that springs up on a rocky hill called *Puy d'Enfer*. St.-Maixent has a college, and 4320 inhabitants, who manu-

facture serge, woollen hosiery, and common woollen stuffs, and trade in corn, mustard, wool, mules, and cattle. *Rohan-Rohan* or *Frontenay*, 11 miles S. from Niort, a town of 2263 inhabitants, gave the title of duke to a branch of the family of Rohan.

The arrondissement of Bressuire is named from *Bressuire*, a town of 3000 inhabitants, situated in a wild mountainous country, 35 miles N. from Niort, on the Dolo, a feeder of the Argenton. The town has a handsome granite church, a tribunal of first instance, a seminary, and some woollen and cotton manufactures. *Thouars*, 15 miles N.E. from Bressuire, built on the slope of a hill above the Thouet, has a college and 2244 inhabitants. It is surrounded partly by the Thouet, and partly by strong tower-flanked walls, erected in the 13th century. The town has narrow and tortuous streets, with pretty good houses; it suffered frequently in the civil wars of 1793 and 1815. The ruins of the abbey of St.-Jean and the castle of Thouars, which stands on a rock 100 feet high, and is washed on three sides by the river, are very interesting objects. The castle, which was erected in 1635 by the wife of Henri de la Trémouille, duke of Thouars, is built on the model of the Tuileries; it has been made over by the heirs of the house of La Trémouille to the commune of Thouars on condition of keeping the buildings in repair. Drugget, cutlery, linen, hats, and leather are the chief industrial products of Thouars.

The arrondissement of Melle is named from *Melle*, an ill-built town, situated on a steep hill above the Béronne, a feeder of the Boutonne, in a pretty and fertile country, 17 miles E.N.E. from Niort. Melle has a tribunal of first instance, a college, and 2687 inhabitants, who manufacture serge, coarse woollens, leather, and paper; and trade in corn, clover seed, wool, cattle, and mules of fine breed, for which the arrondissement of Melle is famous all over France. *Chef-Boutonne*, at the source of the Boutonne, is an ancient village, with 2366 inhabitants. *La-Mothe-St.-Héraye*, on the right bank and near the source of the Sèvre-Niortaise, and 8 miles N. from Melle, has numerous flour-mills, and a population of 2653. The castle, situated in the eastern part of the town, formerly considered the finest specimen of turreted architecture in Poitou, was demolished in 1842.

The arrondissement of Parthenay is named from its chief town *Parthenay*, which is situated in a woody mountainous country, 33 miles N.N.E. from Niort, on a hill near the Thouet, and has a tribunal of first instance, a college, and 4781 inhabitants. This town was the capital of the Gâtine; it was often besieged by the English, and suffered considerably in the Vendean rebellion of 1793. It is ill built, but contains some interesting structures, among which are the remains of an ancient castle, the gate of St.-Jacques, the church of St.-Jean (a structure of the ninth century), the prison, the hospital, and the town-house. Woollen cloth, serge, drugget, and leather are manufactured. *Airvault*, a well-built town, of 2000 inhabitants, stands on the right bank of the Thouet; in the middle of the principal street there is a fountain which turns a mill at a little distance, and sends water into every house in the town. *Moncoutant*, 16 miles W.N.W. from Parthenay, situated near the right bank of the Sèvre-Nantaise, in a fine flax country, has 2026 inhabitants, who manufacture linen, and a great quantity of linsey-woolsey. *Thenezay*, 12 miles E.N.E. from Parthenay, in a good white wine district, has a population of 2116.

The department forms, with that of Vienne, the see of the bishop of Poitiers; it is included in the jurisdiction of the High Court of Poitiers, and in the 14th Military Division, of which Nantes is head-quarters. Under the late monarchy it returned 4 members to the Chamber of Deputies; it now has 7 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1850; *Annuaire du Commerce*, Paris, 1850.)

SEWARD, ANNA, was born in 1747. Her father was the rector of Eyam in Derbyshire, prebendary of Salisbury, and canon residentiary of Lichfield. Mr. Seward, who in 1750 published an edition of Beaumont and Fletcher, encouraged the literary tastes of his daughter, and in 1782 she published her poetical novel of 'Louisa,' which met with great success. In 1799 she published a collection of 'Sonnets intended to restore the strict rules of the legitimate sonnet.' They are now very little known. In 1804 she published her 'Life of Dr. Darwin.' She continued to publish small poems of questionable merit; but still maintained her popularity.

She died in March, 1809, bequeathing to Sir Walter Scott her literary performances, and to Mr. Constable, the publisher, her 'Letters.' Scott published in 1810 her 'Poems,' and three volumes of literary correspondence, with a biographical preface. Mr. Constable also published her 'Letters' in six volumes.

SEWER, a place, according to Lord Coke, where water issues, or, as is said vulgarly, 'sues,' whence the word suera, or sewer. The word gives the title to 'The Law of Sewers.' The superintendence of the defences of the land against the sea, and against inundation by land-floods, and of the free course of navigable rivers, has been immemorially, says Callis, a matter of public concern: and from very early periods commissions have been issued by the crown, empowering persons to enforce the law on such subjects. Many statutes have been passed relating to sewers. The first, according to Lord Coke, is 'Magna Charta,' c. 23, which provides for the taking down of weirs. But the most important of these is 23 Hen. VIII. c. 5, commonly called 'The Statute of Sewers,' by which the law was extended, explained, and settled. Several statutes have been since passed, but the most comprehensive is the 3 & 4 Wm. IV. c. 22. From these two statutes, the decisions especially on that of Henry VIII., and the text-books, the general law of sewers must be ascertained. The act of William IV. does not affect any private or local act for sewers concerning any county or district, &c., or any commission of sewers in the county of Middlesex within ten miles of the Royal Exchange, except

such as lie within any commission of sewers of the county of Essex, or any navigable river, canal, &c., under the management of trustees, by virtue of any local or private act, or any law, custom, &c., of Romney Marsh or Bedford Level. The appointment of commissioners of sewers by the late act is vested in the lord chancellor, the lord treasurer, and the two chief justices, or any three of them, of whom the chancellor must be one.

The authority of the commissioners extends over all defences, whether natural or artificial, situate by the coasts of the sea, all rivers, watercourses, &c., either navigable or entered by the tide, or which directly or indirectly communicate with such rivers, &c. But they have no jurisdiction over any ornamental works situate near a house and erected previous to the act of William IV., except with the consent in writing of the owner. They have power to repair and reform the defences, and to remake them, when decayed, in a different manner, if this can be done more commodiously. They may also cause rivers, &c., to be cleansed and deepened, and remove any obstructions, such as weirs, mill-dams, and the like, which have been erected since the time of Edward I.; or, if such ancient obstructions have been since increased, they may remove the increase. If any navigable river is deficient in water, they may supply it from another where there is an excess. But the object to be attained by all these acts must be of a general nature, and have for its purpose the furtherance of public general defence, drainage, or navigation. The commissioners have power to make general laws, ordinances, and provisions relating to matters connected with sewers in their district, as well as to determine in particular instances. These laws are to be in accordance with the laws and customs of Romney Marsh, in Kent.

The commissioners, or any six of them, when duly assembled, constitute a court of record. By their own view, or the report of their surveyor, they may ascertain what old defences need repair, what new ones are necessary, what impediments or annoyances require removal, what money or materials must be provided for such purposes. To form a court, ten days' notice to the owners or occupiers of lands within the district who are required to attend are necessary, except in a case of emergency, when it may be summoned by two commissioners immediately. It is the duty of the sheriff, on receipt of the precept of the commissioners, to summon a jury from the body of the county to attend in their court. Before any charge can be laid, the commissioners must further inquire, through means of the jury, by witnesses examined on oath before them, where it is that any defence is needed or any nuisance exists; and by whose neglect or default, if any, such things have occurred, and what parties are liable to contribute to the expenses of putting all in a proper condition. The general fundamental criterion by which the liabilities of parties to contribute must be ascertained, is the circumstance of their deriving benefit or avoiding injury from the works of sewers. (Callis 'On Sewers;' 4 'Inst.;' Comyns's 'Digest,' 'Sewers;' Viner's 'Abr.,' 'Sewer.')

The sewers of the City of London and its liberties are under the care of commissioners appointed by the corporation, who were first empowered to make the appointment by the 19 Chas. II., c. 31, the act for rebuilding the city after the great fire. They were entrusted with this power by that act for seven years only. A few years afterwards it was made perpetual; and by 7 Anne, c. 9, the commissioners of sewers for the City of London were invested within the city and its liberties with all the authorities possessed by the ordinary commissioners elsewhere.

The Roman law ('Dig.' 43, tit. 12, 13, 14, 15, 21, 23) contains certain provisions as to public rivers, cuts for navigation, and private and public drains in towns (cloacæ).

SEWERS. Covered drains or sewers of great size, and of very solid construction, still exist under the streets of some ancient Roman cities, and especially of Rome itself. [Cloacæ.] In modern times the sewers of London stand unrivalled for extent and excellent construction, although much yet remains to be done to render them adequate to the necessities of an immense and constantly-increasing population. Full one-third of the sewers in the City of London were made in the ten years preceding 1834. A return made by the Westminster Commissioners of Sewers shows that between 1807 and 1834 there had been built, within the Ranelagh Level, 2692 feet of open and 6886 feet of covered sewers, making a total length of 9578 feet, at the cost of the commissioners; while the length made during the same period by private persons was 91,708 feet. In the Holborn and Finsbury division 31,000 feet of new sewers were made in that district between 1822 and 1831, at a cost of more than 23,000*l*. In the Tower Hamlets division, nearly 25,000 feet of new sewers were proposed in 1834 or 1835, of which four-fifths were completed by 1840. In 1841 the total length of main sewers in the Holborn and Finsbury division was 438,451 feet, or 83 miles.

Until 1847 there were seven Boards of Commissioners of Sewers in the metropolis, each having control over a particular district. It was often found that great inconvenience and expense resulted from the want of agreement between these boards; and at length a Metropolitan Commission of Sewers was appointed by Act of Parliament. The Commission commenced its labours in 1847. It has control over the whole of the metropolis except the City; but the City Commission has agreed to act as far as possible in conjunction with it.

All the sewers constructed by the Metropolitan Commissions of late years are of such dimensions as to allow a man to pass through them, for the purpose of inspecting or cleansing them. The smallest sewers in the City of London division are about four feet three inches high by two feet three inches wide, the dimensions being increased, according to circumstances, up to ten feet by eight feet. The water brought down by the Fleet River is conducted from Holborn Bridge by two sewers, from twelve to fourteen feet high, and six feet six inches wide, one on each side of Farringdon

Street. These sewers unite, towards the mouth, into one passage about eighteen feet by twelve.

The bricks and cement in the London sewers are of the best quality; but the form of the sewers varies greatly; some engineers preferring one form, some another. Nearly all the modern sewers however have an inverted arch at the bottom; and curved forms are also generally given to the sides and the top. The inclination of sewers must vary greatly in different districts, but should always, if possible, be sufficient to enable the water to run freely, and to carry off the solid matter that usually enters with it. In the metropolitan sewers the inclination varies from a quarter of an inch to an inch and a quarter in ten feet. In some cases it is very difficult to obtain sufficient inclination in a sewer, and still to make it deep enough to drain the basement story of neighbouring houses; which may be readily conceived from the fact that some parts of London are below the level of high water. Wherever it is practicable, new sewers are built at a considerable depth from the surface. The depth of that in Watling Street, in the City of London, which is an extraordiuary case, is from thirty-three to thirty-five feet. In many cases however there is a space of not more than three feet between the surface of the roadway and the crown of the arch of the sewer. Where private drains are to be laid into a sewer for the purpose of draining houses, it is necessary that the lowest pavement of the floor of the building be at least four feet above the level of the sewer; because the house would otherwise be liable to be flooded with water from the sewer, when unusually full. Drains leading from private houses are usually of a circular form, and nine inches in diameter, though some are of greater size.

The construction of gully-holes and shoots for conducting the surface drainage of the streets into the sewers varies considerably in different parts of the metropolis. It has been usual, until very recently, to make apertures, called *Man-Holes*, at convenient distances, to enable persons, when necessary, to enter and cleanse the sewers; these apertures, in some instances, are built in the form of oblong shafts of brickwork, up to within about eighteen inches of the surface of the road, and covered with cast-iron plates, over which the roadway is made good. A later and better plan is that of side entrances. These are passages extending from the side of the sewer to the footpavement, through which they may at any time be entered by unlocking and opening a cover or trap-door, consisting of pieces of flag-stone mounted in an iron frame. When a person enters the sewer by one of these openings, the cover is held open by a self-acting catch, and an iron-grating, which admits light and air, rises into its place, and serves to prevent any passenger from accidentally falling in. These entrances greatly facilitate the operation of *flushing* or cleansing the sewers. The necessary body of water for flushing is produced by simply accumulating the ordinary contents of the sewer, which may be done either by a cast-iron grate, fitting closely to a frame-work built into the sewer, and rising to the height that the head is required to be, or by a drop plank or gate of the same material, sliding up and down in nearly vertical grooves. In either case the apparatus may be managed, by means of the side entrances, with the greatest facility. The ordinary run of water in the sewers has hitherto been found sufficient for the purpose; but in case of its proving otherwise, a supply of water for flushing might be readily procured from the water companies.

The subject of the application of sewage refuse to the purposes of manure has recently attracted much attention. Two companies obtained acts of parliament, the one in 1846, and the other in 1847, under the designation of the 'Metropolitan Sewage Manure Company,' and the 'London Sewage Chemical Manure Company.' The plan of the former company is to collect the contents of some of the sewers of Westminster and Pimlico, and convey them by a deep underground channel to Hammersmith, where a steam-engine and other apparatus distributes the manure in a liquid state to the market-gardens of that neighbourhood. The plan of the second company is to collect the contents of three sewers which now fall into the Thames between Vauxhall Bridge and Westminster Bridge, and, after allowing the liquid part to flow into the Thames, to deprive the refuse of its offensive smell, and sell it as manure in a solid state.

Since the Metropolitan Commissioners of Sewers commenced their operations in 1847 many steps have been taken towards a comprehensive sewerage for the whole of the metropolis. A survey of the metropolis is now being made for the Commissioners by the officers belonging to the Ordnance Survey. The survey will extend to a distance of 8 miles in every direction from St. Paul's, comprising an area of about 201 square miles. On a scale of five feet to a mile, the results of this survey would fill 900 large sheets, and would form a magnificent map of London eighty feet in diameter. While the survey and map are in progress, the Commissoners have invited tenders of plans for a comprehensive sewerage of the metropolis. A very large number of such plans were sent in to the commissioners in the early part of the present year (1850), and are now under consideration. Many of the plans embrace an application of sewerage refuse to the purposes of manure.

The sewerage of principal towns will in future be managed under the provisions of the Health of Towns Act of 1848 (11 & 12 Vict. c. 63).

SEXAGE'SIMA, the second Sunday before Lent, or the next to Shrove Tuesday. Brady, in his 'Clavis Calendaria,' vol. i. p. 175, says, 'The name of the first Sunday in Lent having been distinguished by the appellation of *Quadragesima*, and the three weeks preceding having been appropriated to the gradual introduction of the Lent fast, it was consistent with propriety to call the three Sundays of these weeks by names significant of their situation; and reckoning by Decades, the Sunday preceding Quadragesima received its present title of *Quinquagesima*, the second *Sexagesima*, and the third *Septuagesima*.

SEXAGESIMAL, a name given to the system of reckoning in which each unit is the sixtieth part of the preceding, to which, in our day, we

are only accustomed by the method of measuring angles and time.

SEXES OF PLANTS. The necessity for the contact of two cells having different properties, in order to the perfect development of the seed of plants, has long since been admitted by botanists. As this process resembles that which takes place in the impregnation of animals, the term sexes has been employed to denote the fact of the existence of the two kinds of cells.

Some of the facts occurring in the vegetable kingdom which demonstrate the existence of the two kinds of cells are as follows:—One kind of date-tree requires the presence of another in order to produce fruit. If we examine the flowers of the two trees, we shall find that one kind possesses pistils, and that the other possesses stamens, and it is not till the latter come in contact with the former that seeds are formed and the fruit comes to perfection. This was remarkably exemplified in the year 1800, in Lower Egypt, when the Mussulmans, being at war with the French, were unable to go into the woods to obtain the wild stamen-bearing flowers, and the consequence was a total failure that year of the date crop. The same thing occurs with all plants which have their pistils on one plant and their stamens on another. Monœcious plants, or those which have their stamens and pistils on different flowers in the same plant, exemplify the same thing. If we take a cucumber plant, which is monœcious, and cut away early in their growth the stamen-bearing flowers, the pistil-bearing flowers will produce no fruit.

The stamens and the pistils, that are placed in different flowers in the date and the cucumber, are placed together in the same flower in many plants, which are thence called hermaphrodite. If we take the flower of one of these plants, say an apple-blossom, and cut out of it the stamens, it will be found that the pistil, instead of increasing in size and becoming an apple, will die away. Another proof is seen in what are called double flowers. In these flowers, which are very common amongst the cultivated species of plants, the petals are increased in number and size at the expense of the stamens; the stamens in fact being metamorphosed into petals. In these flowers the same thing occurs as if the stamens had been cut away; the pistil is not fertilised, and neither seeds nor fruit are the result of their growth.

Although the antagonism of the reproductive cells in the Cryptogamia was supposed not to exist, the recent researches of Suminski on the reproduction of Ferns, and Thwaites on the Algæ, lead to the supposition that all reproduction of entire plants takes place by the contact of the two cells.

SEXTANS (the Sextant), a constellation which Hevelius had the singular bad taste to place on the back of the Hydra and at the feet of the Lion. It comes directly between the bright stars α Leonis (Regulus), and α (or Cor) Hydræ.

SEXTANT. The history of the sextant was involved in some doubt until the late Professor Rigaud undertook to investigate the subject. The result will be found in the 'Nautical Magazine,' vol. i., p. 351, and No. xxi. The following account is a brief outline of his inquiry.

The early modern navigators used the *Cross-Staff*; this was afterwards exchanged for Davis's *Back-Staff*, called by the French *Quartier Anglais*. Hooke proposed an instrument for the purpose of taking altitudes at sea, which is very ingenious: the sun was seen reflected from a plane glass, while the horizon was viewed directly*. Hooke does not seem to have esteemed his invention so highly as it deserved, for in a subsequent lecture on astronomy and navigation, in 1694, he makes no mention of this, but describes a quadrant of a different construction. In 1699 Newton exhibited an instrument to the Royal Society, which is described as 'the old instrument mended of some faults;' and at some later time he communicated to Dr. Halley a scheme for an instrument which was probably never executed, but of which a drawing and description were found among Dr. Halley's papers after his death in 1742. ('Phil. Trans.,' vol. 42, p. 155.)

The date of the invention of Hadley's Quadrant was proved, on examination by the Royal Society, to have been not later than the summer of 1730. A notice of it was given at a meeting of the Society, May 13, 1731; and the instrument exhibited May 27. The memoir is published, vol. 37, p. 147.

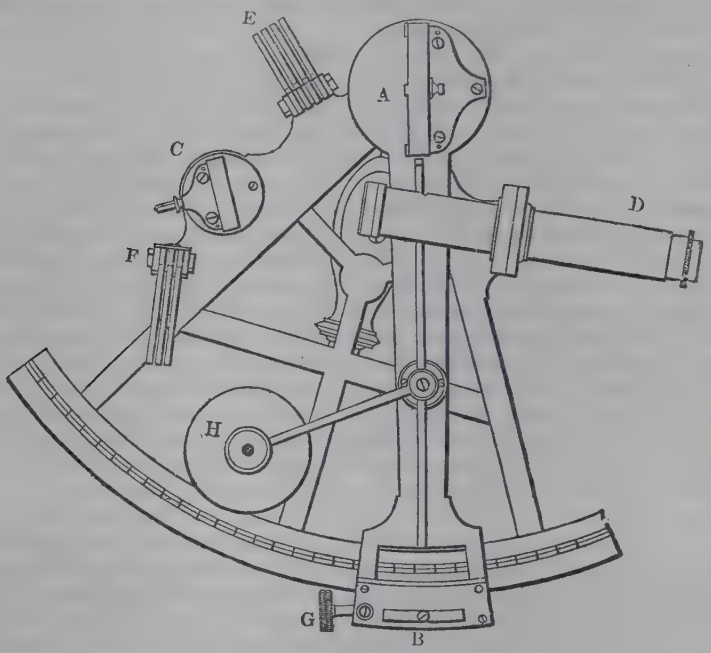
At the meeting of the Society, May 20, Dr. Halley expressed an opinion that the principle of Hadley's new instrument had been discovered and proposed by Newton, and a search was made into the minutes of the Society to ascertain the fact. The only notice which could be found was that already mentioned, viz. in 1699, and this was clearly an improvement of an old instrument, and not the proposal of one new in principle. Halley, at a meeting on the 16th of the following December, expressed himself satisfied that Hadley's instrument was much different from that formerly invented by Sir Isaac Newton. It seems not unlikely that Halley's recollections were of the instrument which Newton had proposed to him, and the description of which was found among his papers, but that he had forgotten the manner of the communication, and confounded the latter instrument with that which Newton had exhibited to the Royal Society. This is, we think, a very probable failure in the memory of a man of seventy-six, and what many younger persons experience daily. That Halley did not immediately see the advantages of Newton's latter proposal may appear a little strange, but Halley's forte clearly did not lie in mechanical construction or astronomical observation.

A little after Hadley's invention, viz. about October or November, 1730, Thomas Godfrey of Philadelphia, a glazier by trade, proposed and had executed an instrument which he called a bow, very much resembling Hadley's earlier construction. This was described in a letter to Dr. Halley from James Logan, Esq., dated 25th May, 1732. Mr. Logan had put off writing more than twelve months after the instrument was placed in

* This is described in Hooke's 'Posthumous Works,' p. 503, and was probably presented to the Royal Society in 1666. In practice, besides some other objections, it would have been troublesome to ascertain the *index error* in this construction.

his hands, and this neglect threw some doubt on the originality of the invention, which could only be satisfactorily established by additional evidence. After examination the Royal Society came to the conclusion that Godfrey's discovery was also original. We think it is clearly proved that the priority is due to Hadley, and that there is no pretence for doubting Godfrey's originality. Some hasty writers, adopting mere hearsay for their guide, have attempted to give the subject a national and patriotic colour, which, unphilosophical at all times, is a simple absurdity when the contending parties are, as in this instance, of the same race. We have thus tried to give a hasty summary of Professor Rigaud's statements and conclusions, which we entirely adopt. The perusal of the original memoirs will gratify the lover of exact and discriminating research. Hadley's second construction, which is incomparably superior to his first and to Godfrey's bow, scarcely differs from the present sextant.

The sextant is figured and described in almost every book of navigation, and is so commonly to be met with, that we shall be very brief. A is a



plane glass, called the *Index Glass*, silvered behind, and perpendicular to the face of the instrument. It is fixed on a centre perpendicular to the instrument, and moves with the *Index Bar* AB, the end of which, B, slides over the graduated arc. C is a plane glass, the lower half of which, next the instrument, is silvered, and the upper half left clear. It is called the *Horizon-Glass*, and should be parallel to the index-glass when the index points to 0° at the beginning of the arc. D is a telescope for viewing the objects observed. This should be of good quality and with an inverting eye-piece. In the common quadrants there is merely a plate with a small hole for directing the sight. Suppose a ray of light to proceed from the eye, it will proceed in the direction of the telescope, and if it falls on the upper or unsilvered part of the horizon-glass, it will pass forward in a continued straight line until it falls upon some exterior object. But if the ray falls upon the silvered part of the horizon-glass, it will be reflected to the index-glass (the horizon-glass is so placed as to make equal angles with lines from the eye and index-glass), and again reflected from the index-glass outwards (*i.e.* from the observer), until it meets some external object. Now instead of supposing the rays to pass from the eye, suppose them to come from external objects to the eye; then there will be two images presented at the same time, one formed by the rays which pass through the unsilvered part of the horizon-glass, and another formed by the rays which have been previously reflected by the two glasses; and it is easily shown from the elementary principles of optics, that when two objects are thus apparently seen in coincidence, the angle which they subtend at the point of meeting is exactly double the angle which is contained between the planes of the index and horizon glasses, if these be supposed to be prolonged until they meet. Hence, if the index be at zero when the glasses are parallel, and if the arc be divided into half-degrees which are numbered and subdivided as whole degrees, the arc actually read off, after any such observation as is here described, will measure twice the inclination between the glasses (for this inclination is evidently the same as the angle between the parallel position of the index-glass and its new position), and, in consequence of the optical principle above mentioned, this will be the true measure of the angle between the objects when they are so distant that the place of the eye and the intersection of the rays may be considered to be the same. The sextant therefore furnishes the means of measuring the angle between any two well-defined objects, in whatever direction they may be placed (so that the angle does not exceed 140°), and without requiring more steadiness than is

necessary for seeing the objects distinctly. E and F are sets of dark glasses of varying intensity, which may be turned before either the index or horizon glass when required; G, a tangent screw for giving slow motion to the index-bar; H, the reading microscope and reflector. The handle below is visible in the drawing, and there is a screw behind the collar of the telescope for giving an up-and-down motion to the telescope, which alters its distance from the plane of the instrument without affecting its parallelism thereto.

SEXTON, an officer of the church, whose name is supposed to be a contraction of *Sacristan*, the name of the person who in ancient times had the care of the sacred vessels and other things used in religious services. The greater simplicity of protestant ceremonies has rendered this duty one of small importance, and it is now usually performed by the parish clerk; so that the sexton has sunk into an officer whose chief business it is to see to the preparation of graves and to assist in depositing the corpses. To him also belongs the care of sweeping the church, and other similar menial offices.

SEXTUS EMPI'RICUS, a Greek philosopher, who was writing about A.D. 200. Nothing is known of his life. His name Empiricus is supposed to be derived from his belonging to the medical school of the Empirici, for he is said to have been a physician. His work entitled 'Pyrrhonian Hypotypóses,' contains the arguments of the ancient sceptics. [SCEPTICISM.] There is another work by him, the Latin title of which is 'Adversus Mathematicos,' the arguments in which are directed against grammarians and historians, rhetoricians, geometricians, arithmeticians, astrologers, and musicians. The works of Sextus probably contained all that the author could collect against the dogmatists, and all that the sceptics could urge on their side. What he says he does not present as his own, but as the exposition of the school of the sceptics. The objections of the sceptics seem to be directed solely against philosophical systems, for they considered phenomena true for practical purposes. The edition of J. A. Fabricius, Leipzig, 1718, folio, contains the Greek text of Sextus and the Latin version.

SEYCHELLES ISLANDS are a group of islands situated in the Indian Ocean, N.E. of Madagascar, between 3° and 5° S. lat., and 53° and 56° E. long. These islands rest on an immense bank of sand and coral, which is said to extend from N.W. to S.E. more than 240 miles, and in width between 30 and 90 miles. It is a kind of vast platform in the sea, on which the superstructure of the islands has been raised. The general depth of water on the bank varies between 12 and 40 fathoms. It is free from dangers, but the ground-swell is very great on it.

The number of islands, including the small islands is nearly 30, of which however only fifteen are of any importance from their size or produce.

The surface of the islands is irregular, presenting a diversity of hill, rock, and ravine, without any extent of level land. The rocks are granitic; the soil is in some parts scanty, but good; it produces abundance of wild fruits and vegetables. Cultivation is carried on only in the narrow valleys, the soil there being deeper and richer than on the higher grounds, from which it is often washed down by the rains. The island of Mahé, which is the largest, is 16 miles long and from 3 to 4 broad. The rugged chain of granitic hills which passes through its centre is about 400 feet above the sea in the highest parts. The Seychelles Islands contain many good harbours. The climate is fine and healthy. The vegetable produce is various, and includes the Coco do Mar, of which the natives eat the fruit, and use the leaves and wood for various domestic purposes.

The population is about 7000, of whom only about one-tenth are whites.

The town of *Mahé* is situated on the north-east side of the island of the same name, in a small glen, irregularly built, and containing only a few good houses inhabited by persons of respectability, who generally prefer living in the environs. It carries on trade with Mauritius and Bourbon.

The Seychelles were partially explored by Lazarus Picault, in 1743. About the year 1768 the French formed a colony on the island of Mahé. The Seychelles capitulated to the English in 1794, but were not taken possession of. On the capture of Mauritius however in 1810, they were occupied; and by the peace of Paris in 1815 they were formally ceded to England, together with Mauritius.

SEZANNE. [MARNE.]

SFORZA, JA'COPO ATTE'NDOLO, born about the middle of the 14th century, at Cotignola, a village near Faenza, forsook in early youth his occupation of a labourer to enlist in one of those companies of adventurers which were then numerous in Italy. After serving under several 'condottieri,' or leaders, he attached himself to Alberico da Barbiano, who aspired to the glory of delivering Italy from the foreign mercenaries, and forming a national militia. In 1376 Pope Gregory XI., who was residing at Avignon, sent an order to his legate in Italy to endeavour to restore the authority of the papal see over the towns of the Romagna, which had revolted at the instigation of the Florentines. The cardinal took into his pay a body of foreign mercenaries called the Breton Company, commanded by John Hawkwood, whom the Italians called 'Acuto,' a valiant condottiere of those times. These troops committed the greatest atrocities, and made themselves detested all over Italy. Alberico, supported by Barnabo Visconti, lord of Milan, the Florentines, and by the people of Bologna, Forli, and other towns, marched to attack them, and the two armies met at Marino in the Papal State. The foreign mercenaries were nearly annihilated; the Breton Company was entirely disbanded; and Italy, at least for a time, freed from foreign mercenaries. Alberico was called the Liberator, and he assumed on his standard the motto 'Liberator Italiæ ab Exteris.' Attendolo, who had greatly contributed to the victory, received from Alberico the surname of 'Sforza,' by which name he and his descendants have become known in history.

Sforza subsequently entered the service of Gian

Galeazzo Visconti, lord of Milan. Afterwards he engaged himself to the republic of Florence against the rival republic of Pisa, which had in its service Agnolo della Pergola, another celebrated condottiere. Sforza defeated his antagonist, and the Pisans were obliged to sue for peace. He afterwards entered the service of the Marquis of Ferrara against Ottobuono de Terzi, tyrant of Parma, whom he defeated, and treacherously stabbed to death at an interview at Rubiera. The Marquis of Ferrara obtained by this means the dominion of Parma and of Reggio, and he liberally rewarded Sforza. Sforza afterwards served the Florentines against Ladislaus, king of Naples, whom he defeated near Arezzo. Ladislaus made large offers to Sforza to enter his service, which he accepted, and the king dying soon after, Sforza became great constable or commander-in-chief under his sister and successor Joanna II. In 1417 he was sent by Joanna to Rome to recover possession of that city for the Holy See. After restoring the papal authority, Sforza returned to Naples, when Gianni Caracciolo, the then favourite of Joanna II., attempting to drive him from court, Sforza, at the head of his trusty men, took possession of Naples, and obliged the queen to banish Caracciolo. Shortly after he was sent to Rome to assist Pope Martin V. against his subjects, and as a reward for his successful exertions, the Pope gave to Sforza his native village of Cotignola in fief, with the title of count. Having returned to Naples, he incurred the displeasure of the fickle Joanna, upon which he took the part of Louis of Anjou, count of Provence, an hereditary claimant of the throne of Naples. The queen called to her assistance Alfonso, king of Aragon and of Sicily, who came with a fleet and an army, defeated Sforza, and occupied the city of Naples. But Alfonso abused his victory, and he treated the queen as his prisoner. Sforza came to the assistance of his mistress, and drove away Alfonso. In the meantime Braccio da Montone was ravaging the northern provinces of the kingdom. Sforza marched into the Abruzzi in the midst of winter, but in fording the river Pescara, which was swelled by heavy rains, his horse was carried along by the rapid current, and Sforza was drowned.

SFORZA, FRANCESCO, born in 1401, son of Jacopo, received from Queen Joanna the title of count, and several domains in the kingdom of Naples. He afterwards entered the service of the Duke of Milan, but being ill-rewarded, he accepted the offers of the Venetians and the Florentines, and led their allied forces against the Milanese, who were commanded by Piccinino, a celebrated condottiere, whom he repeatedly defeated, A.D. 1438–41. The Duke of Milan, in great alarm, offered Sforza his daughter Bianca, with the city and territory of Cremona for a dowry. Sforza assented, concluded a peace between the belligerents, and the marriage was solemnised Oct., 1441. But soon afterwards the Duke of Milan, becoming suspicious of his son-in-law, excited against him Pope Eugenius IV., who sent Piccinino to deprive Sforza of his domains in the March of Ancona. Sforza repaired thither, and for several years fought against the troops both of the Pope and of Alfonso, king of Naples. But the death of the Duke his father-in-law opened a new field to his ambition, and he aspired to the sovereignty of the duchy of Milan. This he obtained, with the assistance of Venice, March, 1450. In his new dignity he acted with prudence and mildness. He made some conquests, and embellished the capital. He died March, 1466. His Life has been written by Simonetta, and Corio and the other historians of Milan record his virtues.

SFORZA, GALEAZZO MARIA, son of Francesco Sforza, succeeded his father as Duke of Milan. He was suspicious, cowardly, licentious, and cruel. A conspiracy was formed against him, and on the day after Christmas Day, 1476, he was stabbed whilst on his way to church. His infant son Giovanni Galeazzo was proclaimed duke, under the guardianship of his mother Bona of Savoy. But Ludovico Sforza, brother of the deceased duke, took possession of the regency, arrested the dowager duchess, and ultimately usurped the sovereign authority. The young duke married a granddaughter of Ferdinand, king of Naples, who remonstrated with Ludovico on his conduct, but to no effect. Ferdinand armed against him, and Ludovico to avoid the storm, invited Charles VIII. of France to undertake the conquest of the kingdom of Naples. After the suspicious death of Duke Giovanni Galeazzo, which happened in 1494, at the age of twenty-five, Ludovico was proclaimed Duke of Milan, and confirmed by a diploma of the Emperor Maximilian I. But the Duke of Orleans, having become King of France by the name of Louis XII., sent an army to the conquest of the duchy of Milan, under Trivulzio, a Milanese noble, and a personal enemy of Ludovico Sforza. The Venetians and Pope Alexander VI. having joined the French, Sforza was obliged to yield to the storm, and he took refuge in Germany.

The French entered Milan in 1499, without opposition, and Louis XII. was proclaimed Duke of Milan. In January, 1500, the people of Milan revolted, and in the following February Ludovico Sforza re-entered his capital. The French however kept their ground in the fortresses, and new reinforcements coming from France, Ludovico marched against them to Novara, but he was defeated and taken prisoner, and sent to France, where he was imprisoned in the castle of Loches till 1508, when he died. After many years of war in Italy, in which the French, Germans, and Spaniards were engaged, during which the two sons of Ludovico Sforza, Maximilian and Francesco, were for short periods seated on the ducal chair, Lombardy became finally an Austrian dependency, and the house of Sforza became extinct.

'SGRAVESANDE, WILLIAM JACOB, a Dutch mathematician and philosopher, was born at Bois le Duc, Sept. 27, 1688. When sixteen years old he was sent to the University of Leyden to study the law, and before the end of 1707 he took the degree of doctor. On his return to the Hague he followed for a time the profession of a barrister, but in 1713, a society of young men of

talent having undertaken a work entitled 'Le Journal Littéraire,' he furnished for it, besides numerous extracts from works relating to mathematics and natural philosophy, a paper on the construction of the air-pump, one on the theory of the collision of bodies, and several other original dissertations.

In 1715 'SGravesande came to London, where he was made a Fellow of the Royal Society; and after his return to the Hague he was appointed, in 1717, professor of mathematics and astronomy in the University of Leyden. In 1730 he added civil and military architecture to the subjects which he taught, and four years afterwards he undertook to give instruction in a course which comprehended logic, metaphysics, and moral philosophy. He was also occasionally employed as an engineer in superintending the hydraulic operations which were executed in Holland.

This distinguished professor was the first who, on the Continent, publicly taught the philosophy of Newton, and he thus contributed to bring about a revolution in the physical sciences. He married in 1720, and had two sons, who died within eight days of each other, when the eldest was 14 and the other 13 years of age. He died Feb. 28, 1742.

The principal works of 'SGravesande are his 'Essai de Perspective,' 1711; 'Physices Elementa Mathematica,' &c., 1720; 'Philosophiæ Newtoniæ Institutiones in Usus Academicos,' an abridgment of the preceding work, Leyden, 1723; 'Matheseos Universalis Elementa,' &c., Leyden, 1727; 'Introductio ad Philosophiam,' &c., 1736. He also edited a collection of the works of Huygens, and the 'Arithmetica Universalis' of Newton.

SHAD. [Clupeidæ.]

SHADDOCK. [Citrus.]

SHADWELL, THOMAS, was born in Norfolk in 1640. He was bred to the law, but quitted it, and travelled abroad. On his return to England he produced his first comedy of 'The Sullen Lovers,' which was so well received that he continued in his dramatic career, and became of sufficient importance to be set up by the Whigs as a rival of Dryden. In 1688, on the dismissal of Dryden from the situation of poet laureate, Shadwell succeeded him. He died in 1692.

Shadwell owes his immortality to ridicule. The world, on Dryden's authority, think he 'never deviates into sense.' His plays however are by no means destitute of wit and liveliness, and their faults seem for the most part to have been occasioned by haste and carelessness. He often wrote a play in a month.

SHAFTESBURY. [Dorsetshire.]

SHAFTESBURY, ANTHONY ASHLEY COOPER, First EARL OF, was the son of Sir John Cooper, and was born at Wimborne St. Giles, in Dorsetshire, July 22, 1621, and inherited the estates both of his father and of his maternal grandfather, Sir A. Ashley. Sir Anthony Ashley Cooper was entered of Exeter College, Oxford, in 1636; and in 1638 he became a student of law at Lincoln's Inn. In his 19th year, he was returned as one of the members for Tewkesbury to the parliament which met in April, 1640. He did not sit in the next—the Long Parliament; but he adhered to the royal interest till he was deprived, in 1643, of the government of Weymouth, upon which, says, Clarendon, 'he gave himself up, body and soul, to the service of the parliament.' The next year, having raised a force in Dorsetshire under a parliamentary commission, he took the town of Wareham, and reduced all the surrounding country. He sat as one of the members for Wiltshire in the first (Barebones) parliament assembled by Cromwell after his dissolution of the Long Parliament, April 28, 1653; and by this parliament or convention he was appointed one of the Protector's council of state, in which capacity it is affirmed that he gave a strenuous opposition to Cromwell's designs. He represented the town of Poole in the next parliament, which met Sept. 3, 1654; and he was also a member of Oliver's last parliament, which assembled Sept. 17, 1656, and of that convened by Richard Cromwell, Jan. 27, 1659.

After the deposition of Richard Cromwell, Sir Anthony Ashley, although he did not enter into any correspondence with the king, incurred the suspicion of the council of state, and was for a time in some danger. In the Convention Parliament, which met April 20, 1660, Sir Anthony was one of the select committee appointed to draw up the invitation to the king, and one of the commissioners sent over to Breda. Monk indeed appears to have acted under his direction. As soon as Charles had come over, Sir Anthony was made lord-lieutenant of the county of Dorset, chancellor of the exchequer, and a privy councillor; and the following year he was raised to the peerage as Baron Ashley of Wimborne St. Giles. He also sat as one of the commissioners of oyer and terminer on the trial of the regicides, in October, 1670.

As chancellor of the exchequer, Lord Ashley is said to have had almost the entire management of the treasury in his own hands; but so long as Clarendon retained his influence, he was found acting with what we may call the opposition section of the ministry. On the death of his relative, the Earl of Southampton, in May, 1667, Ashley, retaining his old office, was appointed one of the commissioners for executing the office of lord treasurer. After the fall of Clarendon, Lord Ashley formed one of the celebrated Cabal Ministry, but he has never been accused of having received any of the French gold with which some of his associates were bribed; and he appears to have resisted, though ineffectually, the shutting up of the exchequer in January, 1672, of which he has been charged by some writers with being the adviser, and it was by his advice that Charles published the declaration for suspending the execution of the penal laws against the Nonconformists and Recusants, in March, 1672.

In April, 1672, Lord Ashley was created Earl of Shaftesbury; and in November following, on the resignation of Sir Orlando Bridgman, he was raised to the office of lord chancellor. His conduct in this office has been represented in very opposite lights; but it appears that, without much knowledge of law, his natural sagacity enabled

him to do substantial justice in most cases that came before him, and to acquit himself to the satisfaction both of the public and the profession. He retained the seals till November 1673, when he was dismissed from office, no doubt by the influence of the Duke of York and the popish party. Among the most remarkable parts of his political conduct while chancellor, are his compliance with the king's command to issue writs for supplying vacancies in the House of Commons during the prorogation of parliament; his strenuous advocacy of the war with Holland; and his eager and effectual support of the Test Act, which was passed in that session. Of the Corporation Act, passed twelve years before, he had been a decided opponent.

On his dismissal from office, Shaftesbury at once openly joined the ranks of opposition, which, being in a majority in the house of commons, could only be kept in check by repeated prorogations. When parliament reassembled in Feb. 1677, Shaftesbury contended that the parliament had been actually dissolved by being so long kept in a state of suspension; upon which the house of lords voted that he should acknowledge his error, and beg the king's pardon on his knees at the bar, and, when he refused to do this, he was committed to the Tower. He applied to the Court of King's Bench, and repeatedly petitioned both the king and the House of Lords; but he was not released till he at length consented, after an imprisonment of above a year, to make the submission originally required. In November, 1680, the House of Lords resolved that these proceedings were 'unparliamentary from the beginning, and in the whole progress thereof,' and ordered them all to be obliterated from their journals.

Soon after his release occurred the strange affair of Titus Oates and the alleged Popish Plot, in prosecuting which Shaftesbury took so eager a part that he has been thought to have been its contriver, and he doubtlessly turned it to much account in the promotion of his party or personal objects. When the new council, consisting of thirty members, was established in the early part of 1679, Shaftesbury was made its president. It was immediately afterwards that he drew up and carried through parliament the Habeas Corpus Act, which in those days was commonly called Lord Shaftesbury's Act. In October following however he was dismissed from his office of president of the council. On June 26, 1680, he appeared at the bar of the Court of King's bench, and formally presented the Duke of York to the grand jury as a Popish recusant. The grand jury were sent for by the court, and dismissed while they were considering the indictment. When however the king found it expedient to allow the parliament to meet in Oct., the bill for excluding the duke from the throne, which had been brought forward in the last session, was again passed by the Commons; and a new prorogation was had recourse to in January, 1681. Then followed the Oxford parliament, which was found equally intractable with its predecessors, and was put an end to in the same manner. For some time before this, Shaftesbury had been in close alliance with the Duke of Monmouth; and alarmed at the aspect of his designs, the court resolved to make a bold effort to destroy the powerful demagogue. Shaftesbury was seized by an order of council at Thanet House, in Aldersgate Street, July 2, 1681, and was committed to the Tower on a charge of high treason. But when the bill of indictment was preferred against him at the Old Bailey, Nov. 24, the grand jury ignored it. Shaftesbury seems now to have felt that there was no safety for him in England, and he fled to Holland, Nov. 18, 1682. He resided at Amsterdam until his death in Jan. 21, 1683.

The most complete Life of Shaftesbury is that drawn up under the direction of his great grandson, the fourth earl, by Mr. Benjamin Martin and Dr. Kippis, which was reprinted in 1836, in 2 vols. 8vo, under the superintendence of Mr. C. W. Cooke, by whose name it sometimes passes.

SHAFTESBURY, ANTHONY COOPER, Third EARL OF, grandson of the first Earl of Shaftesbury, was born at Exeter House, London, Feb. 1671. He was very early instructed in Greek and Latin, and could read those languages at the age of eleven. He was afterwards sent to Winchester, and then travelled on the Continent, whence he returned to England in 1689. In 1693 he entered parliament as one of the members for Poole; but his health suffering, he resigned his seat in 1698, and went over to Holland, where he made the acquaintance of Bayle, Le Clerc, and other distinguished persons. His father dying the following year, he returned home, and distinguished himself in the House of Lords; but after the accession of Anne, he never took any part in public life. His last years were entirely dedicated to literature. In 1708 he published his 'Letter on Enthusiasm;' in 1709, his 'Moralists, a Philosophical Rhapsody;' the same year his 'Sensus Communis, or Essay on Wit and Humour,' in which he announced his famous doctrine of ridicule being the test of truth; in 1710, his 'Soliloquy, or Advice to an Author;' in 1711, a collected edition of all these works. He died at Naples, whither he had gone on account of his health, Feb. 15, 1713. A complete collection of his various pieces appeared soon after his death, in three volumes, under the title of 'Characteristics of Men, Manners, Opinions, and Times.'

SHAGREEN, a sort of leather grained so as to be covered with small round pimples or projections. It is made chiefly of the skin of horses, asses, and mules. The skin is soaked in water, scraped, and stretched on frames. While soft, small seeds, such as mustard seeds, are pressed into it, and it is then dried with the seeds in it. The seeds are afterwards beaten out, and the skin has then that pimpled graining which is peculiar to the leather. It is afterwards polished, soaked in a ley, and died of various colours.

SHAHABAD, a considerable town in Hindustan, in the territory of the King of Oude, in 27° 40′ N. lat. and 79° 53′ E. long., about 85 miles N.W. from Lucknow, and about 18 miles S. from Shahjehanpoor. There are many large houses and remains of fortifications.

SHAH-JEHAN, or *King of the World*, the title assumed by Khurrem-Shah, the fifth of the Mogul emperors of India, who succeeded his father Jehanghir Selim Shah, A.D. 1627 (A.H. 1037). In his father's lifetime he had distinguished himself by his bravery and military skill; and when, in 1628, the revolt of a powerful chief named Khan-Jehan Lódi, who took refuge with the independent Moslem kings in the Deccan, gave rise to a war, the contest, after continuing for several years, ended in the subjugation of the kingdom of Ahmednuggur (1631), while the more powerful states of Bejapoor and Golconda were in 1636 rendered tributary to the court of Delhi. A war with the Uzbeks in Balkh (1644–7) and with Candahar was less successful. The war in the Deccan was renewed in 1655; and Aurungzebe, the son of Shah-Jehan, who was viceroy in the south, gained great advantage over Bejapoor and Golconda. But a dangerous illness, which seized Shah-Jehan in 1657, led to a civil war between his four sons for the succession. Arungzebe, who gained the victory, confined his father in the citadel of Agra, where he died Dec. 1666. The magnificence of Shah-Jehan's court was unequalled even in the tales of oriental pomp. The famous Peacock Throne, the jewels composing which were valued at 6,000,000*l.*, was constructed by order of Shah-Jehan. The superb mausoleum of the Taj-Mahal at Agra, which he built for the sepulchre of his favourite queen, and in which he himself lies interred, is unsurpassed perhaps by any similar edifice.

SHAHJEHANPOOR, a town of Hindustan, now included in the province of Delhi and subpresidency of the North-Western Territory, is situated in 27° 54′ N. lat. and 79° 50′ E. long., about 100 miles N.N.W. from Lucknow, direct distance. It is seated on the Gurruck, a quiet winding stream. The town is large, and contains about 50,000 inhabitants. There is a castle, and some stately old mosques, most of which are ruinous; but the houses are in good condition, and the bazaars show activity and opulence. The town was founded by Shah-Jehan.

SHAKE, in Music (indicated by *tr.*), is the alternate and rapid iteration of two sounds which are not less than a semitone nor more than a whole tone apart.

SHAKERS, a religious sect which arose in England, in Lancashire, about 1747. The founders were Quakers, and they were called Shakers, from the violent shaking of their bodies in their religious exercises. In 1758 they were joined by Anne Lee, who in 1770 laid claim to divine inspiration. In 1774, she and some of her followers set sail from Liverpool for New York. Anne Lee fixed her residence at Watervliet, on the Hudson, not far from Albany. She died at Watervliet in 1784. In 1832 there were 6000 Shakers in the United States. The property of each family or community is held in common; and celibacy being strictly enjoined, the numbers can only be kept up by converts.

SHAKSPERE, WILLIAM. In the register of baptisms of the parish church of Stratford-upon-Avon we find, under the date of April 26, 1564, the entry of the baptism of William, the son of John Shakspere. The entry is in Latin—'Gulielmus filius Johannes Shakspere.' The date of William Shakspere's birth has always been taken as three days before his baptism; but there is certainly no evidence of this fact. John Shakspere, the father of William, as shown by these registers, was married and living in the parish of Stratford in 1558. He was no doubt settled there earlier; for in the archives of the town, by which his course may be traced for some years, we find that he was, in 1556, one of the jury of the court-leet; in 1557, one of the ale-tasters; at Michaelmas of that year, or very soon afterwards, he was elected a burgess or junior member of the corporation; in 1558 and 1559 he served the office of constable, which duty appears then to have been imposed upon the younger members of the corporate body; lastly, in 1561, he was elected one of the chamberlains. What the occupation of John Shakspere was cannot be very exactly determined. He has been described as a butcher, a dealer in wool, and a glover. These occupations were not in those days incompatible with the pursuits of a yeoman. The mother of the poet was Mary Arden, of an ancient family, 'the daughter and one of the heirs of Robert Arden, of Wellingcote.'

Of these parents, then, was William Shakspere born, in 1564, in the town of Stratford. In that town there is a street retaining its ancient name, Henley Street, being the road to Henley-in-Arden, where, in 1574, stood two houses with a garden and orchard annexed to each; and these houses were then purchased by John Shakspere. It is said that William Shakspere was born in one of these houses. There is nothing to prove that the poet was not born in the house in Henley Street; and there that house still stands as it was, altered according to modern fashion, its gable roofs destroyed,—divided and subdivided into smaller tenements,—part converted into a little inn, part the residence of the person who shows the room where it is alleged that Shakspere first saw the light, and the low-roofed kitchen where his mother taught him to read. The walls of that bed-room are covered literally with thousands of names, inscribed in homage by pilgrims from every region where the glory of Shakspere is known. That house now belongs to the British nation—purchased by voluntary subscription. At the time when Shakspere's father bought this house, it was, no doubt, a mansion as compared with the majority of houses in Stratford. In 1568 John Shakspere became the bailiff, or chief magistrate, of Stratford.

The free-school of Stratford was founded in the reign of Henry VI., and received a charter from Edward VI. It was open to all boys, natives of the borough; and, like all the grammar-schools of that age, was under the direction of men who, as graduates of the universities, were qualified to diffuse that sound scholarship which was once the boast of England. We have no record of Shakspere having been at this school; but there can be no rational doubt that he was educated there. His father could not have procured for him a

better education anywhere. It is perfectly clear to those who have studied his works (without being influenced by prejudices, which have been most carefully cherished, implying that he had received a very narrow education) that they abound with evidences that he must have been solidly grounded in the learning, properly so called, which was taught in grammar-schools.

There are local associations connected with Stratford which could not be without their influence in the formation of Shakspere's mind. Within the range of such a boy's curiosity were the fine old historic towns of Warwick and Coventry, the sumptuous palace of Kenilworth, the grand monastic remains of Evesham. His own Avon abounded with spots of singular beauty, quiet hamlets, solitary woods. Nor was Stratford shut out from the general world, as many country towns are. It was a great highway; and dealers with every variety of merchandise resorted to its fairs. The eyes of Shakspere must always have been open for observation. When he was eleven years old Elizabeth made her celebrated progress to Lord Leicester's castle of Kenilworth; and there he might even have been a witness to some of the 'princely pleasures' of masques and mummeries which were the imperfect utterance of the early drama. At Coventry, too, the ancient mysteries and pageants were still exhibited in the streets, the last sounds of those popular exhibitions which, dramatic in their form, were amongst the most tasteless and revolting appeals to the senses. More than all, the players sometimes even came to Stratford.

A belief has obtained that William Shakspere's family, about his fourteenth year, became embarrassed in their circumstances, and subsequently fell into great poverty. The question is not uninteresting, looking at the probable influence of such a state of his father's circumstances upon the future destiny of the great poet. A passage in the poet's 'Life' by Rowe has led to the painstaking by which this theory has been sought to be established:—'His father, who was a considerable dealer in wool, had so large a family, ten children in all, that, though he was his eldest son, he could give him no better education than his own employment. He had bred him, it is true, for some time at a free-school, where, it is probable, he acquired what Latin he was master of; but the narrowness of his circumstances, and the want of his assistance at home, forced his father to withdraw him from thence, and unhappily prevented his further proficiency in that language. It is without controversy that in his works we scarce find any traces of anything that looks like an imitation of the ancients.' Rowe then goes on to assume that because he did not copy from the ancients he had never read them; he has given us no facts to prove the narrowness of his father's circumstances. Malone however says there is 'abundant proof' that when our author was about fourteen years old his father was 'by no means in affluent or even easy circumstances.' This may be. He supplies however certain extracts from the corporation and parochial books to show that John Shakspere was in 'distressed circumstances.'

Of the earlier part of Shakspere's career nothing can probably ever be known with certainty. His father added to his independent means, we have no doubt, by combining several occupations in the principal one of looking after a little land. Shakspere's youth was, in all probability, one of very desultory employment, which afforded him leisure to make those extraordinary acquisitions of general knowledge which could scarcely have been made, or rather the foundations of which could not have been established during the active life which we believe he led from about his twentieth year. It is in this manner, we are inclined to think, that we must reconcile the contradictory traditions of his early employment.

The earliest connected narrative of Shakspere's life, that of Rowe, says, 'Upon his leaving school he seems to have given entirely into that way of living which his father proposed to him; and in order to settle in the world after a family manner, he thought fit to marry while he was yet very young. His wife was the daughter of one Hathaway, said to have been a substantial yeoman in the neighbourhood of Stratford.' The information which Betterton thus collected as to Shakspere's early marriage was perfectly accurate. He did marry 'the daughter of one Hathaway,' and he was no doubt 'a substantial yeoman in the neighbourhood of Stratford.' At Shottery, a pretty village within a mile of the town, there is yet a farm-house, now divided into two tenements, where it is affirmed that Hathaway dwelt. By a copy of a Court Roll, of the date of 1543, it appears that John Hathaway then held a copyhold estate at Shottery. The identical farm-house or cottage, with its little garden and orchard, remained in the possession of the descendants of the Hathaways till 1838: it was then sold. William Shakspere was married to Anne Hathaway before the close of the year 1582. He was then eighteen years and a half old. This was indeed an early marriage. His wife was considerably older than himself. Her tombstone states that she died 'on the 6th day of August, 1623, being of the age of sixty-seven years.' In 1623 Shakspere would have been fifty-nine years old. The marriage bond and licence were discovered amongst the papers of the Consistorial Court at Worcester in 1836. Early in 1585 twin children were born to him—and they were baptised on the 2nd of February as 'Hamnet and Judeth.'

The cause which drove Shakspere from Stratford is thus stated by Rowe:—'He had, by a misfortune common enough to young fellows, fallen into ill company, and, amongst them, some that made a frequent practice of deer-stealing engaged him more than once in robbing a park that belonged to Sir Thomas Lucy, of Charlecote, near Stratford. For this he was prosecuted by that gentleman, as he thought, somewhat too severely; and in order to revenge that ill usage he made a ballad upon him. And though this, probably the first essay of his poetry, be lost, yet it is said to have been so very bitter, that it redoubled the prosecution against him to that degree that he was obliged to leave his business and family in Warwickshire for some time, and

shelter himself in London.' All this, amongst a great deal of falsehood, probably contained some tissue of the truth—such as the truth appeared to the good old folks of Stratford in Betterton's time, who had heard stories from their grandfathers of what a wild young fellow the rich man was who bought the largest house in Stratford. Malone gravely undertakes to get rid of the deer-stealing tradition, by telling us that there was no park, properly so called, at Charlecote. It is more material that the statute of the 5th of Elizabeth, which Malone also recites, shows clearly enough that the hunting, killing, or driving out deer from any park was a trespass punished at the most with three months' imprisonment and treble damages. Sir Thomas Lucy, who was on terms of intimacy with the respectable inhabitants of Stratford, acting as arbitrator in their disputes, was not very likely to have punished the son of an alderman of that town with any extraordinary severity, even if his deer had been taken away. To kill a buck was then an offence not quite so formidable as the shooting of a partridge now.

Although John Shakspere, at the time of his son's early marriage, was not, as we think, 'in distressed circumstances,' his means were not such probably, at any time, as to have allowed him to have borne the charge of his son's family. It is on every account to be believed that the altered circumstances in which he had placed himself, in connection with the natural ambition which a young man, a husband and a father, would entertain, led him to London not very long after his marriage. There, it is said, the author of 'Venus and Adonis' obtained a subsistence after the following ingenious fashion:—'Many came on horseback to the play, and when Shakspere fled to London from the terror of a criminal prosecution, his first expedient was to wait at the door of the playhouse, and hold the horses of those who had no servants, that they might be ready again after the performance. In this office he became so conspicuous for his care and readiness, that in a short time every man as he alighted called for Will Shakspere, and scarcely any other waiter was trusted with a horse while Will Shakspere could be had.' Steevens objects to this anecdote of the horse-holding, that the practice of riding to the playhouse never began, and was never continued, and that Shakspere could not have held horses at the playhouse-door because people went thither by water. We believe there is a stronger objection still: until 'Will Shakspere' converted the English drama from a rude, tasteless, semi-barbarous entertainment, into a high intellectual feast for men of education and refinement, those who kept horses did not go to the public theatres at all. There were representations in the private houses of the great, which men of some wit and scholarship wrote, with a most tiresome profusion of unmeaning words, pointless incidents, and vague characterisation,—and these were called plays; and there were 'storial shows' in the public theatres, to which the coarsest melodrama that was formerly exhibited at Bartholomew Fair would be as superior as Shakspere is superior to the highest among his contemporaries. But from 1580 to 1585, when Shakspere and Shakspere's boys are described as holding horses at the playhouse-door, it may be affirmed that the English drama, such as we now understand by the term, had to be created. We believe that Shakspere was in the most eminent degree its creator. He had, as we think, written his 'Venus and Adonis,' perhaps in a fragmentary shape, before he left Stratford. It has been discovered by Mr. Collier, that in 1589, when Shakspere was only twenty-five, he was a joint proprietor in the Blackfriars theatre, with a fourth of the other proprietors below him in the list. He had, at twenty-five, a standing in society; he had the means, without doubt, of maintaining his family; as he advanced in the proprietorship of the same theatre, he realised a fortune. How had he been principally occupied from the time he left Stratford, to have become somewhat rapidly a person of importance amongst his 'friends and fellows?' We think, by making himself useful to them, beyond all comparison with others, by his writings. It appears to us not improbable that even before Shakspere left Stratford, he had attempted some play or plays which had become known to the London players. Thomas Greene, who in 1586 was the fourth on the list of the Blackfriars shareholders, was said to be Shakspere's fellow townsman. But the young poet might have found another and more important friend in the Blackfriars company:—Richard Burbage, the great actor, who in his own day was called 'the English Roscius,' was also of Shakspere's county. In a letter of Lord Southampton to the Lord Chancellor Ellesmere (written about 1608), introducing Burbage and Shakspere to the chancellor, it is said:—'They are both of one county, and indeed almost of one town.' It is perfectly clear therefore that Shakspere, from the easy access that he might have procured to these men, would have received inviting offers to join them in London, provided he had manifested any ability which would be useful to them. That ability, we have no doubt, was manifested by the production of original plays (as well as by acting) some time before he had attained the rank and profit of a shareholder in the Blackfriars company.

The theory that Shakspere had not produced any of his dramas till several years after he was a shareholder in the Blackfriars theatre, is generally upheld by the assertion that he is not noticed by any contemporary writer till after the period usually assigned to the commencement of his career as a dramatic author; that is, about 1592. There is an allusion to 'Hamlet' by Nashe, in 1589; and the most reasonable belief is, that this was Shakspere's 'Hamlet.' We believe with Dryden and Rowe, that a remarkable passage in Spenser's 'Thalia' applies to Shakspere, and that poem was published in 1591.

If the instances of the mention of Shakspere by his contemporaries during his lifetime be not numerous, we are compensated by the fulness and explicitness of one notice—that of Francis Meres, in 1598. Nothing can be more decisive as to the rank which Shakspere had then taken amongst the most eminent of his contemporaries.

'As the Greek tongue is made famous and eloquent by Homer, Hesiod, Euripides, Æschylus, Sophocles, Pindarus, Phocylides, and Aristophanes; and the Latin tongue by Virgil, Ovid, Horace, Silius Italicus, Lucanus, Lucretius, Ausonius, and Claudianus; so the English tongue is mightily enriched, and gorgeously invested in rare ornaments and resplendent habiliments, by Sir Philip Sidney, Spenser, Daniel, Drayton, Warner, Shakespeare, Marlow, and Chapman.

'As the soul of Euphorbus was thought to live in Pythagoras, so the sweet witty soul of Ovid lives in mellifluous and honey-tongued Shakespeare; witness his 'Venus and Adonis,' his 'Lucrece,' his sugared sonnets among his private friends, &c.

'As Plautus and Seneca are accounted the best for comedy and tragedy among the Latins, so Shakespeare, among the English, is the most excellent in both kinds for the stage; for comedy, witness his 'Gentlemen of Verona,' his 'Errors,' his 'Love Labours Lost,' his 'Love Labours Won,' his 'Midsummer's Night Dream,' and his 'Merchant of Venice;' for tragedy, his 'Richard II.,' 'Richard III.,' 'Henry IV.,' 'King John,' 'Titus Andronicus,' and his 'Romeo and Juliet.'

'As Epius Stolo said that the Muses would speak with Plautus's tongue, if they would speak Latin; so I say that the Muses would speak with Shakespeare's fine filed phrase, if they would speak English.'

Shakspere, however indispensable a protracted residence in London might be to his interests and those of his family, never cast aside the link which bound him to his native town. In 1596 his only son died, and in Stratford he was buried. In 1597 he purchased the principal house in Stratford. In 1595 Shakspere held a much more important rank as a sharer in the Blackfriars Theatre than in 1589; and the Globe Theatre also belonged to the body of proprietors, of which he was one.

Shakspere, during the last year or two of the 16th century, and the opening years of the 17th, was for the most part in London. In 1601 his father died; and his burial is registered at Stratford. Shakspere appears then to have had three brothers living,—Gilbert, Richard, and Edmund.

In 1603 James I. ascended the throne of England. Lord Southampton, who had so imprudently participated in the conspiracy of Essex, was a favourite of the new king; and one almost of the first acts of the reign was a grant of a patent to the proprietors of the Blackfriars and Globe Theatres. In this patent the name of Shakspere stands the second; the names mentioned being 'Lawrence Fletcher, William Shakspere, Richard Burbage, Augustine Phillips, John Hemmings, Henry Condell, William Sly, Robert Armyn, Richard Cowley.' Soon after this period it is believed that Shakspere retired from the exercise of his profession as an actor. But he continued to hold his property in the theatre. In 1608 the Corporation of London attempted to interfere with the actors of the Blackfriars; and there being little chance of ejecting them despotically, a negociation was set on foot for the purchase of their property. A document found by Mr. Collier amongst the Egerton papers at once determines Shakspere's position in regard to his theatrical proprietorship. It is a valuation, containing the following item:—

'Item. W. Shakespeare asketh for the wardrobe and properties of the same playhouse 500*l.*, and for his four shares, the same as his fellows Burbidge and Fletcher, viz. 933*l.* 6*s.* 8*d.* . . . 1433 6 8'

We may now suppose that the great poet, honoured and esteemed, had retired to Stratford, retaining a property in the theatre — regularly writing for it. But the years from 1604 to his death, in the April of 1616, were not idly spent. He was a practical farmer, we have little doubt. It is our opinion that Shakspere continued to write till he was removed by death; and that the Roman plays were the beginning of a series. Who will finish that series?

In 1607 Susanna, the eldest daughter of Shakspere, married a physician resident at Stratford—a man of high professional eminence—Dr. Hall. In 1608 his grand-daughter Elizabeth was born. To this child he bequeathed a sum of money, and all his plate, 'except my broad silver and gilt bowl.' Shakspere was a grandfather at forty-three. In 1608 his mother died—the mother, doubtless, of his ardent love.

We approach the end. 'Shakspere, according to the register of Stratford, was buried on the 25th of April, 1616.

He survived the marriage of his daughter Judith to Thomas Quiney only two months, and he made his will probably upon the occasion of that marriage. It is dated the 25th of March, but in the document February was first written, and afterwards struck out. By this will, which is long, he gives his real estates to his eldest daughter. According to the received interpretation of his will, Shakspere treats his wife with neglect and 'bitter sarcasm,' for which estranged affections would have been no warranty; and consigns her, with a solemn avowal of contempt and hatred, to a miserable dependence, not even recommended or implied, upon the bounty of their common children. According to the dictum of Malone, who first dragged this part of his will into notice sixty years ago, 'His wife had not wholly escaped his memory; he had forgot her, he had recollected her, but so recollected her as more strongly to mark how little he esteemed her; he had already (as it is vulgarly expressed) *cut her off, not indeed with a shilling, but with an old bed.*' It was the object of Shakspere by this will to perpetuate *a family estate.* In doing so did he neglect the duty and affection which he owed to his wife? He did not. His estates, with the exception of a copyhold tenement, expressly mentioned in his will, were *freehold.* His wife was entitled to *dower.* She was provided for amply, *by the clear and undeniable operation of the English law.*

We subjoin a Chronological Table of Shakspere's Plays, which we have constructed with

some care, showing the *positive* facts which determine dates *previous* to which they were produced.

Chronological Table of Shakspere's Plays.

Henry VI., Part I.	Alluded to by Nashe in 'Pierce Pennilesse,'	1592
Henry VI., Part II.	Printed as 'The First Part of the Contention,'	1594
Henry VI., Part III.	Printed as 'The True Tragedy of Richard Duke of York,'	1595
Richard II.	Printed	1597
Richard III.	Printed	1597
Romeo and Juliet	Printed	1597
Love's Labour's Lost	Printed	1598
Henry IV., Part I.	Printed	1598
Henry IV., Part II.	Printed	1600
Henry V.	Printed	1600
Merchant of Venice	Printed 1600. Mentioned by Meres	1598
Midsummer Night's Dream	Printed 1600. Mentioned by Meres	1598
Much Ado about Nothing	Printed	1600
As You Like It	Entered at Stationers' Hall	1600
All's Well that Ends Well	Held to be mentioned by Meres as 'Love's Labour's Won,'	1598
Two Gentlemen of Verona	Mentioned by Meres	1598
Comedy of Errors	Mentioned by Meres	1598
King John	Mentioned by Meres	1598
Titus Andronicus	Printed	1600
Merry Wives of Windsor	Printed	1602
Hamlet	Printed	1603
Twelfth Night	Acted in the Middle Temple Hall	1602
Othello	Acted at Harefield	1602
Measure for Measure	Acted at Whitehall	1604
Lear	Printed 1608. Acted at Whitehall	1607
Taming of the Shrew	Supposed to have been acted at Henslow's Theatre, 1593. Entered at Stationers' Hall	1607
Troilus and Cressida	Printed 1609. Previously acted at Court	1609
Pericles	Printed	1609
The Tempest	Acted at Whitehall	1611
The Winter's Tale	Acted at Whitehall	1611
Henry VIII.	Acted as a new play when the Globe was burned	1613

Out of the thirty-seven plays of Shakspere the dates of thirty-one are thus to some extent fixed in epochs. These dates are, of course, to be modified by other circumstances. There are only six plays remaining, whose dates are not thus limited by publication, by the notice of contemporaries, or by the record of their performances; and these certainly belong to the poet's latter period. They are

Macbeth.	Julius Cæsar.
Cymbeline.	Antony and Cleopatra.
Timon of Athens.	Coriolanus.

SHALE. Any argillaceous deposit, naturally divided into laminæ parallel to the plane of deposition, is rightly so called by geologists. There are sandy, calcareous, purely argillaceous, and carbonaceous shales. Geologists sometimes, very inconveniently, call fine-grained very laminated shales by the title of Slates.

SHALLOT. [Allium.]

SHANG-HAE, a sea-port in China, situated near 31° N. lat. and 121° E. long., is built on the left bank of the river Woosung, which is properly only the channel by which the waters of the Lake Tahoo or Taï (the Great Lake) are discharged into the sea. Though the course of the river probably does not exceed fifty miles, it brings down a great volume of water, and is very deep. Opposite the town of Shang-hae, which is about ten miles from its mouth, the depth in the middle of the stream varies from six to eight fathoms, so that the largest vessels can come up to the harbour, and unload alongside of the commodious wharfs and large warehouses which occupy the banks of the river. At this place the river is nearly half a mile wide.

The town is very large. The streets are narrow, and many of them are paved with small tiles, similar to Dutch clinkers, which make a more agreeable footing than the slippery granite with which other towns in China are paved. The shops in the city are generally small, but wares of all descriptions are exhibited for sale; many of them contain European goods, especially woollens.

By the treaty of Nankin, Aug. 29, 1842, the port of Shang-hae (in the same manner as those of Canton, Amoy, Foochoo, and Ningpo) was thrown open to British merchants; a British consul resides there; and tariffs of imports and exports, as well as inland and transit duties, have been established. The result has been the formation of a large British trade at Shang-hae. In 1846 the vessels which entered and left the port amounted to 148, with an aggregate burden of 42,608 tons. The goods imported in that year were valued at 810,200*l*., and those exported at 1,352,530*l*.

The cottons and woollens imported, and the tea and silk exported, in the three years 1844-5-6, were as follows:—

		£
Cottons	3,001,794 pieces	1,872,785
Woollens	2,359,868 yards	424,020
Tea	21,020,633 lbs.	967,230
Silk	30,834 bales	2,132,690

The magnitude of this foreign trade at Shang-hae is accounted for by the circumstance that there is no harbour on the Chinese coast between 30° and 35° N. lat. The Woosung is the first river south of these limits which is deep enough for the purposes of navigation, and hence the whole maritime commerce of this tract is concentrated at Shang-hae. The country which lies at the back of the coast is the most populous part of China, and contains many very large towns. A steamer plies regularly between Shang-hae and Hong-kong.

SHANNON, the largest river in Ireland, has its source at the southern base of the Kulkeagh Mountain, whence it flows in a deep dead sluggish stream into Lough Allen, in the county of Leitrim, a small basin about 8 miles long and from 3 to 4 broad. After leaving Lough Allen, the river runs in a southerly direction for 6 miles, when it receives the waters from two small lakes called Boyle Water and Lough Key. It soon afterwards passes the towns of Leitrim and Carrick-on-Shannon, and flows through Lough Corry, Lough Boffin, and Lough Forbes. After passing Termonbarry and Lanesborough, and receiving the waters of the Camlin, the Shannon enters Lough Ree, which extends 16 miles in length, by 1 to 3 in breadth; it reaches within 2 miles of Athlone. Between this place and Lough

Derg the river makes two large bends, and dividing itself into various branches forms islands, some of which are of considerable size. Near Shannon Bridge the river Suck joins the Shannon from the west, and at Shannon Harbour the Brusna falls into it on the east. At this point is the junction of the Grand Canal with the Shannon; and immediately opposite is another canal which extends to Ballinasloe. About 5 miles below Banagher the Lower Brusna falls into the Shannon from the east, and a wide and uninterrupted channel conducts the river into Lough Derg, an oblong lake 24 miles long by 1 to 3 broad. In this portion lie the Ballyshrule and Woodford rivers, streams of considerable size, and navigable for large boats. Below Killaloe the navigation of the river is interrupted by a series of falls. Immediately above Limerick the river divides into two branches, forming King's Island, on which the old town stands, with the cathedral, castle, and other public buildings.

All the portion hitherto described is called the Upper Shannon. It is much interrupted by shallows and falls; and numerous small canals have been cut for continuing the navigation. Such canals have been made near Lough Allen (5 miles), Jamestown (2 miles), Rooskey ($\frac{3}{4}$ mile), Termonbarry ($\frac{1}{2}$ mile), Lanesborough ($\frac{1}{4}$ mile), Athlone ($1\frac{1}{4}$ mile), Shannon Bridge ($\frac{1}{8}$ mile), Banagher ($\frac{1}{4}$ mile), Meelick (2 miles), Killaloe (2 miles), Castle Connell (7 miles), and Limerick (1 mile).

Under the name of the Lower Shannon is comprehended that part of the river below Limerick which is navigable for sea-going vessels. This æstuary is easy of access, and its approach is free from dangers; the entrance between the Loop Head and Kerry Head is 7 miles wide, and on the former stands a lighthouse, showing a bright fixed light at the height of 270 feet above high-water. Between Kilkadran Point and Beal Point the width is contracted to about a mile. There is a second lighthouse on Kilkadran Point. Five miles above Kilkadran Point is Scattery Island, on the Clare coast, about three-quarters of a mile long, rather low and marked by one of the Round Towers; it has a battery on its southern point. Five miles S.E. of Scattery is Tarbert Peninsula (formerly an island), on which is a lighthouse showing a brilliant fixed light 58 feet above the sea. Above this the river contracts to less than a mile in width. Eight miles above Tarbert is Foynes Island, between which and the mainland there is a good harbour, though the entrance is rather intricate. Above Foynes, near which the river Fergus enters, the Shannon becomes interrupted by islands, rocks, and shoals, which, though mostly covered at high water, greatly impede the navigation at other times. For 8 or 9 miles below Limerick the river is so shallow that at low-water every vessel must lie aground; and even far below this there is not a spot where a landing can be effected except through the mud. At Limerick a very fine range of quays has been constructed. Besides the Fergus, the principal rivers which flow into the Lower Shannon are the Maigue and the Askeaton. There is good anchorage in every part of the Lower Shannon, and shelter from the prevailing westerly winds at Scattery, Tarbet, Labeshida, and Foynes.

The spring tides in the Shannon rise from 17 to 18 feet, the neaps about 14 feet; the velocity, which at the mouth does not exceed a mile an hour, increases as the river becomes narrower, to upwards of 3 miles during the ebb at springs.

The entire length of the Shannon from its source to the sea is about 220 miles, and it affords (including the canals) an uninterrupted line of navigation which nearly intersects the central part of Ireland from north to south.

As a means of rendering the Shannon more efficient as a navigable river, commissioners were appointed by Act of Parliament in 1839 to apply national funds to this purpose, and exercise control over the whole of the works of the river. These commissioners make annual reports to parliament, on the expenditure of the annual grants, and the progress of the works. Some of the works are managed by the counties, with the aid of grants from the commissioners, to be repaid at certain periods with 4 per cent. interest. The grants of this description, between 1840 and 1847, amounted to 288,000*l.*; of which 145,000*l.*, with 22,000*l.* interest, was repaid by the beginning of 1848. The parliamentary grant for 1847 was 40,000*l.*, and the expenditure 43,000*l.*

SHARP, a character in Music (♯), used to raise by the degree of a semitone any note in the natural scale. [FLAT.]

SHARP, JAMES, Archbishop of St. Andrews, was born in May, 1618, in the castle of Banff. He was educated at the University of Aberdeen, on leaving which he paid a visit to England, but soon returned on being chosen one of the professors of philosophy at St. Leonard's College, St. Andrews. After a short time he exchanged his professorship for the office of minister of the parish of Crail, to which he was appointed by his friend John, earl of Crawford and Lindesay.

In August, 1651, according to Sir James Balfour's 'Annals,' Sharp was one of a number of ministers who were seized and sent off prisoners to England, by order of General Monk, who was then governing Scotland under Cromwell. Sharp is asserted by Presbyterian writers to have purchased the favour of Cromwell, by base compliances, and to have obtained his liberty, while his companions were left in bondage. He appears, at all events, to have, after some time, found his way back to his charge at Crail. A few years after he was sent to London by a party in the Presbyterian church, called the Resolutioners, to plead their cause before Cromwell, by whom he was favourably received. While ingratiating himself with Cromwell, he also maintained a correspondence with Charles II. during all the time of his exile. He still however contrived to retain the confidence of his brethren in the church, and when Monk began his march from the north of England upon London, in January, 1660, five ministers, and the leading men of that party applied to Monk to receive Sharp as their representative, and as a person fully instructed in their views and wishes. He accordingly proceeded to

London, where he arrived Feb. 13; he set out for Breda May 4, returned to London May 26, and appears to have remained there till about the middle of August. During this time he was in close communication with all the leading persons and parties of the day. Many letters written by him at this period have been preserved; and an abstract of them has been given by Wodrow in the Introduction to his 'History of the Sufferings of the Church of Scotland from the Restoration to the Revolution.' The abstract leaves a strong impression of Sharp's dissimulation and treachery. During his absence from Scotland, Sharp had been elected professor of divinity in St. Mary's College, St. Andrews, and appointed his majesty's chaplain for Scotland, with an annual salary of 200*l.* sterling. On the rising of parliament, he went again to London, along with Glencairn, the chancellor, and Rothes, the president of the council, and in a council held at Whitehall was nominated archbishop of St. Andrews. About the middle of December he was consecrated by the bishops of London and Worcester.

Sharp certainly did not allow any recollections of his own very recent renouncement of Presbyterianism, or of the extreme zeal he had been wont to profess for that system of ecclesiastical government, to check his activity and ardour in the maintenance of the opposite order of things that had been now set up. In 1663 he left the declining interest of the Earl of Middleton, to whose support he had been mainly indebted for his nomination to the primacy, and attached himself to his old adversary the Earl of Lauderdale; but their association scarcely lasted two years. In 1664, on the death of the Earl of Glencairn, he made strong application for the office of lord-chancellor, but without success. In the beginning of 1667 he was commanded to come no more to the council-table, but to remain within his diocese; but this restraint was taken off before the end of the year. On July 9, 1668, he was shot at as he was entering his coach in the streets of Edinburgh, by one James Mitchell, a conventicle preacher; but the ball was intercepted by the arm of the Bishop of Orkney, who was following him into the coach. The assassin was discovered five years afterwards, and executed Jan. 1678, after a series of proceedings which, at least according to one version of the story, are little creditable to Sharp's magnanimity. At last, May 3, 1679, the archbishop, while travelling with his eldest daughter from Kennoway, where he had passed the night, to St. Andrews, was attacked by nine men on Magus Muir, dragged from his coach, and slaughtered on the spot with circumstances of the most pitiless barbarity. Two only of the party were tried, and one of them was hung in chains on the spot.

SHARP, JOHN, archbishop of York, was born at Bradford, Yorkshire, Feb. 16, 1644. In 1660 he was admitted of Christ's College, Cambridge; in 1667, he was ordained deacon and priest; and became domestic chaplain to Sir Heneage Finch (then attorney-general, and in 1672 lord chancellor), and tutor to his sons; and proceeded M.A. at Oxford in 1669. In 1676 he was installed a prebendary of Norwich; and in 1677 he was instituted to the rectory of St. Giles in the Fields, London. In 1679 he commenced D.D. at Cambridge, and in the same year he accepted the lectureship of St. Lawrence-Jury, London, which he held till 1683. In 1681 he was made dean of Norwich. Having been chaplain to Charles II., he was reappointed to the same office on the accession of James II., but gave great offence by a sermon which he soon after preached against popery. The bishop of London was commanded to suspend Sharp from further preaching within the diocese. Sharp at first resisted this decree; but ultimately he himself went down to Windsor with an humble petition to the king. James would not even hear this petition read; upon which Sharp left town and went to Norwich, till at length, in Jan. 1687, a letter from the Earl of Sunderland informed him that he might return to his function. In Aug. 1688, Sharp drew up the reasons on which the archdeacons and himself declined to appear before the ecclesiastical commissioners to answer for not obeying the king's orders in regard to the reading of the declaration for liberty of conscience. On Jan. 27, 1689, he preached before the Prince of Orange, and on the 30th before the Convention; on both occasions praying for King James, although on the 28th the Commons had voted that the king had abdicated and that the throne was vacant. After the settlement of the new government, Sharp was, in Sept. 1689, promoted to the deanery of Canterbury. He was pressed to accept the place of one of the deprived bishops; but this he declined, even at the risk of losing the favour of King William; he offered however to accept the archbishopric of York, as soon as it should become vacant by the death of Lamplugh, who was then very ill. Lamplugh died, in fact, within a fortnight after, and Sharp was consecrated archbishop July 5, 1691. Sharp acquired a very high character as archbishop. He died at Bath, Feb. 2, 1714. As a preacher Sharp had a clear, easy, correct style; and his sermons have been repeatedly printed. The last edition was published at Oxford in 1840.

SHARP, ABRAHAM, an ingenious mechanist and a laborious calculator, was born at Little Horton, near Bradford in Yorkshire, in the year 1651. He was placed as an apprentice with a tradesman at Manchester; but, having prevailed on his master to cancel his indentures, he established himself at Liverpool, where he kept a school for the instruction of persons in humble life, and, at intervals of leisure, he applied himself to the study of mathematics, particularly of astronomy. Having obtained possession of a small patrimonial estate, Sharp came to London, where, in 1688, he was engaged with Flamsteed in mounting the instruments which had been provided for the Royal Observatory at Greenwich. He afterwards constructed and graduated for the observatory a mural sector of which the radius was above six feet; and he assisted in forming the famous catalogue (the British) of 2884 fixed stars.

It is however as an accurate calculator that Sharp is particularly distinguished. Having retired to his native town, he computed for Flamsteed most of the tables in the second volume of

the 'Historia Cælestis;' he was also employed frequently in making intricate calculations for Sir Jonas Moore, Dr. Halley, and other mathematicians. In 1717 he published a treatise, in 4to., entitled 'Geometry Improved,' which contains a table of the logarithms of numbers from 1 to 100, and of the prime numbers to 1100 (all computed to the extent of sixty-one decimal places), together with subsidiary tables to be used in forming from them the logarithms of other numbers. He calculated, besides, a table of natural and logarithmic sines, tangents, and secants to every second in the first minute of a degree; and he determined to seventy-four places of decimals the length of the circumference of a circle by means of the series which had been discovered by James Gregory in 1671. Mr. Sharp was never married, and he died, July 18, 1742, at the age of ninety-one years.

SHARP, GRANVILLE, was the son of Dr. Thomas Sharp, prebendary of Durham and archdeacon of Northumberland. Dr. Thomas Sharp was the author of several works, philological, antiquarian, and religious, which were collected and published in 6 vols., 8vo., London, 1763. He was born about 1693, and died in 1758.

Granville Sharp was born in 1734. He was educated for the law, but he quitted that study for a situation in the ordnance-office, which however conscientious motives led him to resign on the breaking out of the American war. In 1769 he published 'A Representation of the Injustice and Dangerous Tendency of Tolerating Slavery in England.' His conduct however in the case of a negro named Somerset, first brought him conspicuously before the public. The negro had been first abandoned, and then claimed as property by his master. Sharp brought the question before the court of King's Bench, and in 1772, by an unanimous decision of the judges, the law of England was declared to be that as soon as a slave sets foot on English territory he becomes free.

Sharp continued to exert himself in behalf of the negroes. He wrote four pamphlets against slavery in 1776. At length the Association for the Abolition of Negro Slavery was formed, the first meeting of which was held in London, May 22, 1787, when Granville Sharp was appointed chairman. He sent out a number of negroes whom he found in the streets of London to Sierra Leone at his own expense, and may be said to have been the founder of the settlement there. He died in July, 1813.

Sharp's writings were numerous, and had many readers at the time when they appeared, but as most of them are pamphlets, and were written for temporary purposes, they are not much referred to now.

SHARP, WILLIAM, was born Jan. 29, 1749, in the Minories, London, where his father carried on the business of a gun-maker. He was apprenticed to an engraver of door-plates, but soon after the expiration of his apprenticeship he exercised his talent in the higher branches of the art. His earliest effort was an engraving of the old lion Hector in the Tower of London, from an original drawing by himself. He was afterwards engaged, in conjunction with Angus, Heath, and Collyer, in decorating the 'Novelist's Magazine' with plates after the designs of Stothard; and he engraved a number of larger plates, after some of the most eminent painters, all of great excellence. The portrait of John Hunter, after Sir Joshua Reynolds, is considered one of the finest specimens of line engraving. In 1814, he was elected a member of the Imperial Academy of Vienna, and of the Royal Academy of Munich. From London he went to reside first at Acton, and next at Chiswick, where he died July 25, 1824.

Mr. Sharp, though in the ordinary transactions of life a man of shrewdness, was, in matters of science and religion, a visionary and an enthusiast. The doctrines of Mesmer, the rhapsodies of the notorious Richard Brothers, and the still more disgusting exhibitions of Johanna Southcott, in turn found in him a warm disciple. By the last named impostor and her confederates, Mr. Sharp was swindled out of the bulk of his savings.

SHAW, THOMAS, was born at Kendal, in Westmorland, about 1692. He entered at Queen's College, Oxford, where he took the degree of M.A. in 1719; and, after receiving holy orders, was appointed chaplain to the English factory at Algiers. He did not return to England until 1734. After his return, various scholastic and ecclesiastical dignities were bestowed on him. He was principal of St. Edmund's Hall, and regius professor of Greek till his death in 1751.

Shaw traversed the whole of ancient Numidia, and visited Syria, Palestine, and the north of Egypt. His geographical details are exact and valuable. In a supplement to his Travels he published an account of 600 plants which he had collected; 140 of which were previously unknown to botanists. The first edition was published in 1738. The best edition of his Travels was published in 1757.

SHAW, GEORGE, the younger son of the Rev. Timothy Shaw, was born at his father's vicarage at Bierton, in Buckinghamshire, Dec. 10, 1751. He was admitted at Magdalen Hall, Oxford, in 1765, where he proceeded B.A. in 1769, and M.A. in 1772. In 1774 he took deacon's orders, and during a short time discharged his clerical duties at two chapelries connected with Bierton. He then went to Edinburgh, and studied natural history, and also medicine, under Black and Cullen, and afterwards returning to Oxford, obtained the appointment of deputy botanical lecturer. On the death of Dr. H. Sibthorp he was chosen professor of botany, but as, by an old statute, clergymen were ineligible, Dr. Shaw lost the appointment. In 1787 he took the degree of doctor of medicine, and removed to London, where he settled as a physician. On the formation of the Linnæan Society, in 1788, Dr. Shaw was appointed one of the vice-presidents, and he afterwards enriched its transactions with many valuable papers. In 1789 he was chosen a fellow of the Royal Society, and in a short time he gave up the practice of his profession, and devoted himself to scientific pursuits. In 1791 he became assistant keeper of natural history in the British Museum; and on the death of Dr. Gray he was

appointed principal keeper. He died July 22, 1813.

His principal works are: 'The Naturalist's Miscellany,' which had reached its 286th number when he died; 'A Catalogue of the Leverian Museum, illustrated with Coloured Plates,' which appeared between 1792 and 1796; and his well-known systematic work on 'General Zoology, or Natural History.'

SHEA-TREE. [Bassia.]

SHEARWATER. [Petrels.]

SHEATHING. [Ship.]

SHEEP. The sheep, according to Cuvier, belongs to the class *Mammalia*, the young being nourished with milk from the mammæ or teats of its mother; to the order *Ruminantia*, with four stomachs, and the organs of digestion disposed for chewing the cud; to the tribe *Capridæ*, with horns persistent, and placed on an osseous nucleus; and to the genus *Ovis*, with or without horns, but these when present uniformly taking, to a greater or less degree, a lateral and spiral direction. The forehead of the sheep is arched, and protruded before the base of the horns; there are no lachrymal ducts; the nostrils are lengthened and oblique, and terminate without a muzzle; there is no beard properly so called; the ears are small; and the legs slender. The hair is of two kinds, one hard and close, and the other woolly—the wool preponderating in proportion as the animal is domesticated. The sheep is principally distinguished from the goat by his convex forehead, by his spiral horn not projecting posteriorly, and more especially, and that in proportion to the care which is bestowed upon him, by the preponderance of wool over the hair, with which, in despite of every effort, the Cashmere goat is covered.

Some naturalists have traced the origin of the sheep to the Argali or the Mouflon. The *Argali* is a species of mountain-sheep, found in small flocks on the high grounds of Asia, extending from the precipices of Kamtchatka in northern Asia, through Mongolia, as far as the Caucasus in western Asia. The *Mouflon* is an inhabitant of southern Europe, Corsica, Crete, and the islands of the Grecian archipelago. They congregate in large groups, and possess all the wildness of the Argali. Neither of these however has the slightest claim to being the original parent of the sheep. They are descendants of those which have escaped from the dominion of man, and are retreating from desert to desert in proportion as the population of the country increases.

The records of olden times are very unsatisfactory with regard to the existence of the sheep in Britain. No early historian makes the slightest mention of them. Even Cæsar, who describes so much at length the employments and habits of the British, never alludes in the most distant manner to the sheep, or the employment of its wool. The subjugation however of Britain having been completed, the conquerors turned their attention to the improvement of the country; and among other things they established a woollen manufactory at Winchester. So well did this succeed, that the woollen cloths of Britain soon began to vie with the productions of every other part of the Roman Empire. The sheep employed in furnishing the material of these productions were the *Short-Woolled Breed*. Winchester was situated in the centre of a country which then, as now, could support short-woolled sheep alone.

It would appear to have been some centuries after this that the *Long-Woolled Sheep* was introduced. The manufactures of the Winchester mills continued however to be duly estimated, and, in point of fact, the cultivation of the various breeds of sheep, and the manufacture of the fleece into many different kinds of cloth, had begun to constitute the chief employment and wealth of the country.

The teeth give certain indications as to the age. The sheep has no incisor teeth in the upper jaw; but there is a dense elastic cushion or pad, and the herbage, firmly held between the front teeth in the lower jaw and this cushion, is partly bitten and partly torn asunder. The sheep has the whole of the incisor teeth by the time that he is a month old, and he retains them until the 14th or 16th month. They then begin to diminish in size, and are displaced. The two central ones are first shed, and the permanent ones supply their place, and attain their full growth when the animal is two years old. Between two and three, the next pair are changed; the third at three years old; and at four, the mouth is complete. After this there is no certain rule, until, two years more having passed, the teeth one by one become loosened and are lost. At six or seven years of age the mouths of the ewes should be occasionally examined, and the loose teeth removed, and then, by good pasture and good nursing in the winter, they may produce lambs until they have reached the ninth or tenth year, when they begin rapidly to decline. Some favourites have lingered on to the 15th or 16th year.

The rings at the base of the horns afford very imperfect indications of the age of the sheep. When untouched, they are little to be depended upon, and their natural irregularities are too often filed away by dishonest dealers.

The covering of the original sheep consisted of a mixture of hair and wool; the wool being short and fine, and forming an inner coat, and the hair of greater length, projecting through the wool, and constituting an external covering. When the sheep are neglected or exposed to a considerable degree of cold, this degeneracy is easily traced. On the Devonshire moors, the mountains of Wales, and the highlands of Scotland, the wool is deteriorated by a considerable admixture of hair. Even among the South Downs, the Leicesters, and the Ryelands, too many *Kemps* occasionally lessen the value of the fleece. It is only by diligent cultivation that the quantity of hair has been generally diminished, and that of wool increased in our best breeds.

The filaments of wool taken from a healthy sheep present a beautifully polished and even glittering appearance. That of the neglected or half-starved animal exhibits a paler hue. This is

one valuable indication by which the wool-stapler is enabled to form an accurate opinion of the value of the fleece. The mixture of hair in the wool can often be detected by close examination with the naked eye, but most readily by the assistance of a microscope.

Among the qualities which influence the value of the wool are fineness, and the uniformity of that fineness in the single fibre and in the collected fleece. This fineness however differs materially in different parts of the fleece. It is finest on the shoulders, the ribs, and the back. It is less on the legs, thighs, and haunch, and still coarser on the neck, the breast, the belly, and the lower part of the legs. The fineness of the wool is considerably influenced by the temperature. Sheep in a hot climate yield a comparatively coarse wool; in a cold climate, they carry a closer and a warmer fleece.

The fineness of the fleece is also much influenced by the kind of food. An abundance of nutriment will increase both the length and the bulk of the wool. This is an important consideration with the sheep-breeder. Let the cold of winter come—let it continue for a considerable period, yet if the sheep is well kept, although the fleece may lose a little weight, this will be more than compensated by its fineness and increase of value. If the sheep however is half-starved while he is exposed to unusual cold, the fibre of the wool, although perhaps somewhat finer, will be deficient in weight and strength and usefulness.

The woolly fibre consists of a central stem or stalk, from which there spring at different distances circlets of leaf-shaped projections, possessing a certain degree of resistance or of entanglement with other fibres, in proportion as these circlets are multiplied and they project from the stalk. They are sharper and more numerous in the felting wools, and in proportion as the felting property exists. They give to the wool the power of felting, and regulate the degree in which that power is possessed.

The number of sheep in the United Kingdom has been more than trebled in the last 150 years. Much ground formerly deemed unworthy of cultivation has been rendered productive; and still more effective than this was the new system of husbandry that was introduced—the artificial or turnip husbandry, by which a regular supply of food could be provided for every season. With this was connected the attempt to fatten sheep still more expeditiously than could be accomplished by any former method. This succeeding beyond his most sanguine expectations, the sheep-master next attempted to increase the size of the breed. He had not however sufficiently taken into account a consequence of this. As the carcase increased in size, the wool became longer, heavier, and coarser. The breeder would not see this at first; but he soon began to find that the manufacturer would not purchase it, for it could not be used for the purposes to which it was formerly applied; and he was compelled to sell it at a diminished price. And what was the consequence? Why that he had no just reason to complain; for the early maturity of the sheep, and the continued value of the wool for many important purposes, rendered his profits greater than they were before he had begun to alter his system.

Short-Woolled Sheep.—The South Downs or their congeners supported the first manufactory at Winchester. The South Downs, and the Hampshire and Wiltshire breeds, were formerly of a very small size, and far from possessing a good shape, but the size and shape have been of late years greatly improved, and the wool is short, close, curled, and free from spiry projecting hairs. The South Downs are adapted to almost any situation in the midland part of England. They have a patience of occasional short keep, and an endurance of hard stocking, equal to any other sheep; an early maturity, scarcely inferior to the Leicesters; and the flesh finely grained, and of good flavour. These sheep occupy the whole of the upper and under hill-grounds of Sussex. Mr. Luccock calculated, that within a certain distance from the downs there were 864,000 sheep of this breed, a number which is only to be accounted for by the great quantity of artificial food that is raised on the arable part of every farm. It has often been attempted to introduce the Leicesters into the neighbourhood of the South Downs, but they could not be driven two or three miles twice every day from the pasture to the fold, and the fold to the pasture.

The average dead weight of the South Down wether varies from 8 to 11 stones. The average weight of the fleece used to be 2 lbs; but from the altered system of management it is now at least 3 lbs. in the hill-sheep, and nearly 4 lbs. in the lowland-sheep. This wool has likewise changed its character. It has become a combing instead of a carding wool. Formerly devoted to the manufacture of servants' and army clothing, or being sparingly mixed with other wool, it is now used for flannels and baizes, and worsted goods of almost every description, thus becoming of considerably-increased value.

The South Downs have succeeded admirably in all the southern districts of the kingdom; but the northern hills have occasionally been too cold for them. Crosses between the South Down and almost every breed of middle-wool sheep have answered well; while in counties where it could have been least expected, the old breed is in a great measure superseded by the South Downs.

In Dorsetshire there is a very different and valuable breed of sheep. They are white; the face long and broad, with a tuft of wool on the forehead; the shoulders low, but broad; the chest deep; the loins broad; and the bone small; a hardy and useful sheep. Their chief peculiarity is the forwardness of the ewes, which supply the market with lamb when it produces the highest price. If they have plenty of nutritious food, the ewes will be in lamb as early as April, so that the young one will drop in September, and be ready for the market at Christmas.

Various breeds of short-wool sheep still prevail on the hills of Devonshire and Cornwall. They are evidently allied to or descended from the Dorset, although it must be confessed that the resemblance is not very flattering to the latter.

In Herefordshire there still remain a few flocks of that breed of sheep which was in former times the pride of the agriculturist—the Ryelands. They are small, polled, with white faces, the wool growing close to and almost covering the eyes, the carcase round and compact, the animal quickly fattening, and the superabundant fat accumulating within. They are hardy, and peculiarly free from disease. They are particularly distinguished by the fineness of their wool.

The Cheviots extend from Westmorland far into Scotland. Their birthplace, or where they were originally observed, and are still found in their greatest purity, is the Cheviot Hills, in Northumberland. They differ essentially from both the black and the dun-faced breeds by which they are surrounded, but neither history nor tradition has given the slightest clue to their origin. Sir John Sinclair says, 'Perhaps there is no part of the whole island where, at first sight, a fine-woolled breed of sheep is less to be expected than among the Cheviot Hills. Many parts of the sheep-walks consist of nothing but peat-bogs and deep morasses. During winter the hills are covered with snow during two, three, or even four months, and they have an ample proportion of bad weather during the other seasons of the year, and yet a sheep is to be found that will thrive even in the wildest part of it. Their shape is excellent. They have a closer fleece than the Tweeddale and Leicester breeds, which keeps them warmer in cold weather, and prevents either rain or snow from incommoding them. They have never any other food but the grass and natural hay of their own fields, except when it is proposed to fatten them. They weigh from 12 to 18 lbs. per quarter, and their meat is fully equal to any that the Highlands can produce.' The wool is inferior to that of the South Downs. It is not so fine as before the improvement of the carcase, and the use of it is abandoned in the manufacture of fine cloth. There are many flocks of pure Cheviots, but in the majority of the flocks there is a cross of Leicester blood.

The other breed of short-woolled sheep which contend with the Cheviots in number and value, is the Black-Faced Scots. They extend from Lancashire to the very north of Scotland. The faces and legs are always black or mottled. The fleece is long and somewhat coarse. The carcase is peculiarly compact; so much so, that on account of the shortness, roundness, firmness, and handsomeness of the carcase, it is called the Short Sheep, in opposition to the Cheviots or Long Sheep. Great numbers of these sheep are sent to the London market.

Long-Woolled Sheep.—In the 13th century certain Florentine merchants were permitted to export from England to Flanders more than 1000 sacks of combing or long wool. In the 14th century the 1000 had extended to 100,000, and that continued during many years; and in the 15th century Edward IV. permitted his sister Margaret to export annually during her life 2000 rams to Flanders and Holland. This well explains the resemblance between the sheep on the two shores; and the traveller will cease to wonder that on the northern coast of France, and through nearly the whole of Flanders, he fancies that he recognises the identical sheep of the Kentish pastures.

There is much more similarity between the varieties of the long-woolled sheep than those of shorter fibre. The deficiency of horns, the form of the head, the expression of the countenance, and the white faces and legs, as well as the colour, weight, and uses of the wool, show that they had one common origin.

The following description of the New Leicester by Mr. Culley will, to a very considerable degree, serve for all the varieties of the long-woolled sheep. The head should be hornless, long, small, tapering towards the muzzle, and projecting horizontally forwards. The eyes prominent, but with a quiet expression. The ears thin, rather long, and directed backwards: the neck full and broad at its base, but gradually tapering towards the head, and particularly fine at the junction of the head and neck. The neck seeming to project straight from the chest, so that there is, with the slightest possible deviation, one continued horizontal line from the rump to the poll. The breast broad and full; the shoulders also broad and round. The arm fleshy through its whole extent, and even down to the knee. The bones of the legs small, standing wide apart, no looseness of the skin about them, and comparatively bare of wool. The chest and barrel are at once deep and round in the ribs, forming a considerable arch from the spine, so as in some cases, and especially when the animal is in good condition, to make the apparent width of the chest even greater than the depth. The quarters long and full, and as wide as the fore-legs. The legs of a moderate length; the pelt also moderately thin, but soft and elastic, and covered with a good quantity of white wool, not so long as in some breeds, but considerably finer. Such is the Leicester sheep as Mr. Bakewell made him. He found him as different an animal as it was possible to conceive—flat-sided, large-boned, coarse-woolled, slow to fatten, and his flesh of little value. The principle which Mr. Bakewell acted upon was, that 'like produces like;' and therefore he selected a few sheep with aptitude to fatten, with a disposition to produce an unusual quantity of valuable meat, with little bone and offal, and with quietness of temper; and from these he exclusively bred. He cared not about near or distant affinities, but his object was to increase every good point, and gradually to get rid of every bad one. They were not different sorts of sheep that he selected, but the best of the breed to which he had been accustomed.

His sheep were smaller than those of his neighbours, but they retained every good point, and had got rid only of the bad ones. The alteration was rapid as well as great in his own flock, and the practice which he introduced of letting some of his rams quickly extended the benefit of his system far and wide.

Such was the origin and the eventual triumph of the New Leicester breed of sheep. They have spread themselves to every part of the United Kingdom. There are few other varieties of long-woolled sheep which do not owe much of their

excellence to the New Leicesters, and even some of the short-woolled flocks are deeply indebted to the breed introduced by Mr. Bakewell. There is no other species of sheep that possesses so decided a propensity to fatten, or that is prepared for the butcher at so early an age. It will not however thrive on a poor soil, nor if it is compelled to travel far in order to procure its food; but on soils of a moderate quality there is no other sheep so profitable. Other breeds, as the Teeswater and the Lincoln, may be superior in size, but it is at an expense of time and of food, and eventually a palpable deterioration of flesh and diminution of profit. There are accounts of the Leicester sheep attaining a very great weight. It should however be remarked that the New Leicester sheep has a smaller quantity of bone in proportion to its weight than any other sheep.

The deficiency of the fleece was formerly objected to in the New Leicester sheep. The truth of the matter was, that, with the early breeders, the fleece was a perfectly secondary consideration, and comparatively disregarded. There is now little cause for complaint on this head. The wool has considerably increased in length, and it has improved both in fineness and strength of fibre. It averages from 6 to 7 lbs. the fleece, and the fibre varies from five to more than twelve inches in length. Like all other British wools, it is applied to a purpose different from that to which it was formerly devoted, and is mostly used in the manufacture of serges and carpets.

The chief value of the New Leicester breed consists in the improvement which it has effected in almost every variety of sheep with which it has been crossed.

The English wool being, from the increased coarseness of the fibre, rejected by the manufacturer in the construction of fine cloths, recourse was had to foreign wools, and to those chiefly that were derived from the Merino sheep. As early as the commencement of the Christian æra, the wool of the Spanish sheep was in great request for the production of the most costly dresses. In less than half a century afterwards we find Columella busily employed in improving the Spanish sheep, and the effect of his labours remained during the long dark ages that succeeded. The present Merino flocks seem to have been produced by a cross of the native breed with a flock sent from England. [Mesta.]

By degrees the Merino sheep found its way to almost every part of the European Continent, and by careful management its fleece rapidly increased in fineness and in usefulness. In 1834 the prime wool produced in Spain readily found a sale at from 3*s.* 6*d.* to 4*s.* per lb. In Saxony it reached to 5*s.* 3*d.* per lb., and in some parts of Hungary to 5*s.* 6*d.* In Australia the cultivation of the Merino sheep and its fleece has proceeded most rapidly and prosperously.

Shearing.—The time for the operation of shearing the sheep will vary much with the state of the animal and of the season. After a cold winter, and the animal having been neglected, the sheep will be ready at an early period, for the old coat will be loosened and easily removed. The operation should never be commenced until the old wool has separated from the skin, and the new coat of wool is sprouting up. The coldness or warmth of the spring will also make a great difference. The usual time for shearing is about the middle of June, and the sheep-master will in a moment perceive when the fitting time is come.

Custom has very properly required that the old fleece shall be cleansed before its removal, by washing the animal in some running stream. Two or three days are then allowed for the drying of the wool previous to its being shorn, the sheep being turned into a clean rick-yard, or field, or dry pasture, and remaining there until the fleece is dried, and in order that the new yolk, which is rapidly secreted, may penetrate through it, giving it a little additional weight and a peculiar softness.

Few rules can be laid down with regard to the rearing and feeding of sheep that will admit of anything like general application. A great deal depends on the kind of sheep, and the nature of the pasture and the food.

Suppose the larger kind of sheep, and on arable ground. The ewes are generally ready to receive the ram at the beginning of October, and the duration of pregnancy is from about twenty-one to twenty-three weeks, bringing the period of parturition to nearly the beginning of March, at which time most of the lambs will be dropped. Rams are fit to propagate their species in the autumn of the second year, and that is also the proper period for the impregnation of the ewes. The ewe is, after impregnation, suffered to graze on the usual pasture, being supplied, as occasion may require, with extra food, and especially in cases of snow, until within five or six weeks of lambing, when turnips are given to her, and continued from that time until the spring of grass renders them no longer necessary.

As the period of parturition approaches, the attention of the shepherd should increase. The ewes should be driven to some sheltered enclosure, and there left as much as possible undisturbed. Should abortion take place with regard to any of them, although it does not spread through the flock as in cattle, yet the ewe should be immediately removed to another inclosure, and small doses of Epsom salts with gentian and ginger administered to her, no great quantity of nutritive food being allowed.

The ewes should now be moved as near home as convenience will permit, in order that they may be under the immediate observation of the lamber. The operation of clatting, or the removal of the hair from under the tail and around the udder, should be effected on every long-woolled ewe, otherwise the lamb may be prevented from sucking by means of the dirt which often accumulates there.

The period of lambing having actually commenced, the process of nature should be permitted quietly to take its course, unless the sufferings of the mother are unusually great, or the progress of the labour has been arrested during several hours, or eighteen or twenty hours or more have passed since the labour commenced.

If any of the newly-dropped lambs are weak, or scarcely able to stand, the shepherd must give

them a little of the milk which at these times he should always carry about him, or he must place them in some sheltered warm place till they are able to join the mothers.

Unless the pasture on which the ewes are placed is very good, it will be adviseable to continue the use of the turnips. A moderate quantity may be given twice in the day, care being taken that the whole of one quantity shall be eaten before any more is placed before them. A little hay will always be serviceable while the flock is fed on turnips. It corrects the occasional watery quality of the turnips, and the sheep usually thrive better than if they are fed either on hay or turnips alone.

At length comes the time for weaning. In a poor country it takes place before the lambs are much more than three months old. In a more plentiful one the lambs may be left until the fourth month is nearly or quite expired. If the pasture is good, and it is intended to sell the lambs in store condition, the weaning may be delayed until six months.

The lambs should not be put on too stimulating food. The pasture should be fresh and sweet, but not luxuriant.

There is a disease of the liver—*the Rot*—to which sheep are especially liable, and which is of a peculiar and very destructive character. In the very earliest stage alone does it admit of cure. The decisive symptom, at that time, is a yellow colour of the eye that surrounds the pupil and the small veins of it, and particularly the corner of the eye, which is filled with a yellow serous fluid, and not with blood. There is no other apparent morbid appearance until it is too late to struggle with the malady; on the contrary, the sheep, although perhaps a little duller than usual, has an evident propensity to fatten.

The rot is inflammation of the liver; and the vessels of it contain fasciolæ (flukes). The flukes are probably more the effect than the cause of the disease. They are taken up in the food; they find their way to the liver as their destined residence, and they aggravate the disease by perpetuating a state of irritability and disorganisation. The rot is evidently connected with the state of the pasture. It is confined either to wet seasons or to the feeding on ground that is moist and marshy. In the same farm there are fields on which no sheep can be turned without getting the rot, and there are others that never give the rot. After long-continued rains it is almost sure to appear. The disease may be communicated with extraordinary rapidity. In the treatment of the rot little that is satisfactory can be done. Some sheep have recovered, but the decided majority perish in despite of every effort. They may however, as giving them a little chance, be moved to the driest and soundest pastures; and they may undergo a regular course of aperient medicine. Mercurial friction may also be used, but, above all, plenty of salt should be placed within their reach, and given to them in the way of medicine.

In the way of prevention the farmer may do much: he may drain the most suspected parts of his farm. No money would be more profitably expended than in accomplishing this. Some of the little swampy spots which disgrace the appearance of his farm possibly lie at the root of the evil.

SHEERNESS. [Kent.]

SHEERS, or SHEARS. The sheers used in masting ships consist of two large poles, the lower ends of which rest upon thick planks laid along the sides of the deck, while their upper ends are lashed together so as to cross each other exactly over the hole in the deck through which the mast is to be dropped, they being sustained in this position by ropes radiating from the top to various parts of the vessel. To this apparatus is attached the tackle necessary for lifting the masts out of the water, when they have been floated to the side of the ship, and lowering them gently into their places. Some ships are masted by the aid of tackle attached to old worn-out ships of war called *Sheer Hulks* while others are drawn up to the side of a *Masting-House* on a quay or pier.

SHEFFIELD, a parliamentary borough in the southern part of the West Riding of Yorkshire, is 163 miles N.N.W. from London by road, and 177 by railway. It has communication by railway with all the principal towns in the kingdom. Sheffield lies at the eastern base of that extensive range of hills which extend along the centre of the island from Staffordshire to Westmorland, and the town is now spread over various uneven but gradually-subsiding tongues of land lying between the Porter, the Riveling, the Loxley, the Sheaf, and the Don, which here unite their waters, and form one considerable river, the Don. With the exception of the level outlet through which the Don flows to Doncaster, Sheffield is encompassed and overlooked by an amphitheatre of hills.

In the beginning of the 17th century Sheffield was still only a large village. It now displays all the features of a manufacturing town of the first importance.

The situation of the town causes it to be well drained, except in a few confined localities. The streets and buildings do not generally present a handsome appearance, but the streets are well paved and lighted with gas. There are few good dwelling-houses in the town, almost all the merchants and principal manufacturers residing in the country; but within the last few years the shops in the principal streets have assumed generally much more ornamental fronts, and various public buildings of some architectural pretensions have been erected. There are several churches in the town, but none of earlier date than the last century. Chapels for the various dissenting bodies are very numerous; they are generally capacious, but few display any architectural ornament.

The public buildings consist of the town-hall, the cutlers'-hall, the corn-exchange, the fire-office, the assay-office, the assembly-rooms, the theatre, the music hall, the news rooms, and public baths. There is a cemetery, and the botanical gardens, which are of considerable extent, for beauty of situation are unrivalled. Among the numerous educational establishments the collegiate school and the medical school deserve special mention. There are a literary and philosophical society, a mechanics' institute, mechanics' library, &c.

Among the charitable institutions are the infirmary, a noble building, the dispensary, and the Shrewsbury hospital. The town is well supplied with water.

The principal manufacture is that of cutlery in all its branches, indeed of everything that can be fabricated of iron or of steel. The vast buildings used for the grinding of all kinds of tools and implements by steam-power form one of the curiosities of Sheffield. Silver-plate and plated goods form also one of the staple manufactures. Brass-foundries are numerous. Articles in Britannia-metal and German silver are also manufactured. Brushes, buttons, combs, and optical instruments, are also made here to a considerable extent; and various workmen are employed on manufactures which are connected with the staple commodities of the town, such as cabinet-case makers, haft and scale pressers and cutters, powder-flask and shot-belt makers, silver-refiners, wood-turners, &c. There are also many mercantile houses, some of which confine themselves to the home markets, while others export to the Continent, to Brazil, the Cape of Good Hope, but especially to the United States of North America. The spring-knife makers and table-knife makers are the largest classes of artisans. The fork makers are an unfortunate class, owing to the injurious effects of what is called dry grinding: the dust of the stone and metal rises in clouds, and is necessarily inhaled by the workmen, the average duration of whose lives is thus very much shortened. It is to the immense coal bed occupying the surrounding district that Sheffield owes its prosperity; for much of the iron which is there converted into steel comes from Sweden.

The parliamentary borough, which returns two members, consists of the parish of Sheffield, and contained in 1841 a population of 109,597. The population of the township was 68,186. The population in 1848 was estimated at 78,176.

SHEFFORD. [Bedfordshire.]

SHEKEL, the principal weight and coin of the Hebrews.

The Shekel as a Weight.—The almost uniform testimony of ancient authors is that the shekel was equal to the Attic tetradrachm, or to the stater (which was the same thing), or to half the Roman ounce, that is to 4 denarii.

The genuineness of the Hebrew coins has been much disputed, but the best numismatists are agreed in rejecting all those which bear inscriptions in the modern or Chaldee character, while they consider those genuine that have inscriptions in the Samaritan or old Hebrew character. The average weight of the shekels of Simon Maccabæus is about 218 English grains, which is about equal to half the English avoirdupois ounce, and only 2 grains more than the Roman half-ounce, or the weight assigned to the shekel by ancient writers.

With respect to the shekel of the time before the Captivity, we have no certain information. On the whole, in the absence of trustworthy information to the contrary, it is most probable that the ancient and the modern skekel were of the same weight, namely, about 218 grains.

The shekel formed the foundation of the Hebrew weights, of which there were three principal denominations: the Shekel, meaning weight; the Maneh, meaning number, that is, a certain number of shekels or weights; and the Kikkar, a round number, or sum total, that is, a certain collection of manehs. The last weight is commonly translated by the word Talent in the Septuagint, Vulgate, and modern versions. There is a remarkable resemblance between this system and that of the Greeks, the shekel, maneh, and kikkar corresponding respectively to the stater, mina, and talent. The words *maneh* and *μνᾶ* are apparently the same, and *shekel* and *στατὴρ*, have the same meaning, the only difference being that whereas the Hebrew unit was the shekel, the Greeks took for their unit not the stater, but the drachma, which was a fourth of it.

The kikkar was equal to 3000 shekels. (Exod. xxxviii. 25.) There is a difficulty about the maneh, since from 1 Kings, x. 17, compared with 2 Chron. ix. 16, it would seem to have contained 100 shekels, while in Ezekiel xlv. 12, it is ordered to contain 60 shekels. There are great difficulties in adopting the former value, and on the other hand the meaning of the passage in Ezekiel is very doubtful. If the latter value be adopted, the kikkar would contain 50 manehs. The shekel was subdivided into the beka, or half shekel, the reba, or quarter-shekel (the zuz or zuza of the Talmudists), and the gerah or the twentieth of the shekel. The following table therefore represents the Hebrew weights :—

Name.	Value in Shekels.	Value in Avoirdupois Weight. lbs.	oz.	grs.
Gerah . .	$0\frac{1}{20}$	0	0	10.94
Reba or Zuza	$0\frac{1}{4}$	0	0	54.71
Beka . .	$0\frac{1}{2}$	0	0	109.43
Shekel . .	1	0	$0\frac{1}{2}$	
Maneh . .	60?	1	14	
Kikkar or Talent	3000	93	12	

There appear however to have been at least two standards of the shekel, the Shekel of the Sanctuary, and the Royal or Profane Shekel. (Exod., xxx. 13; 2 Sam., xiv. 26.) The tradition of the Rabbins is that the shekel of the sanctuary was double the profane shekel.

The Shekel as a Coin. In the earliest mention of money in the Bible (Gen. xxiii. 16) the shekels of silver which Abraham paid to Ephron seem, from the expression 'current money with the merchant,' to have been impressed with some mark, which made it *coin*, of however rude a description. The currency of the Jews from the earliest ages was silver, and the word *silver* is the common Hebrew name for money. Brass money is not mentioned in the Bible. Gold money is first mentioned in David's reign (1 Chron., xxi. 25), and by the time of Isaiah it seems to have been common (Isaiah, xlvi. 6). The proportion of the value of gold to that of silver among the Jews is very uncertain. Bochart, from comparing 2 Sam., xxiv. 24, with 1 Chron. xxi. 25, makes it 12 to 1 in David's time; but this computation rests on very slender grounds. The conjecture, derived from 2 Kings, xviii. 14,

that it was 10 to 1 in Hezekiah's time, seems not improbable.

The earliest Jewish coinage of which we have historical knowledge was that of Simon Maccabæus (1 Macc., xv. 6), which was in silver, and of which several specimens remain. The denominations of the Hebrew money were the gerah, or twentieth of the shekel, which the Septuagint renders by ὀβολός, but which is nowhere expressly mentioned as a coin; the reba, or quarter-shekel (1 Sam. ix. 8); the third part of a shekel is mentioned by Nehemiah (x. 32), but it is not clear that there was a coin of this value; the beka, or half-shekel, which was the poll-tax paid by every Israelite when the census was taken (Exod. xxx. 15); the shekel, which appears to have been the largest coin in use, though some understand the amounts of 15, 20, and 25 shekels, mentioned in the passage of Ezekiel already quoted, to mean coins of that value; the maneh, and the kikkar or talent, were respectively sums of 60 shekels (though this, as already observed, is uncertain), and of 3000 shekels.

The worth of the shekel in our money depends of course upon the quality of the silver, which, for the earlier periods at least, cannot be ascertained. For the later periods, if we assume that the standard was about the same as that of the Roman money, namely, $\frac{1}{30}$th of the weight alloy, the shekel of half an avoirdupois ounce would be equivalent to 210.983 grains of pure silver, or $\frac{210.983}{80.7}$ of a shilling, that is, to 2*s.* 7*d.* 1.49 farthings. According to this calculation, the following table represents the value of the Hebrew money.

			£	*s.*	*d.*	*fgs.*
Gerah	= $\frac{1}{20}$ shekel	=	0	0	1	2.27
Reba	= $\frac{1}{4}$ „	=	0	0	7	3.36
Beka	= $\frac{1}{2}$ „	=	0	1	3	2.72
Shekel	=	=	0	2	7	1.49
Maneh	= 60 shekels	=	7	16	10	.8
Kikkar or Talent	= 3000 shekels	=	396	5	10	

SHELDON, GILBERT, Archbishop of Canterbury, was born July 19, 1598, at Stanton in Staffordshire. In 1613 he was admitted into Trinity College, Oxford; Nov. 27, 1617, he took the degree of B.A., and that of M.A. May 28, 1620. He was elected fellow of All-Souls College in 1622; and having taken holy orders, he became domestic chaplain to Thomas, lord Coventry, keeper of the great seal, who gave him a prebend of Gloucester, and recommended him to King Charles I. On May 2, 1633, he was presented by his majesty to the vicarage of Hackney in Middlesex. He was successively rector of Ickford in Buckinghamshire, and of Newington in Oxfordshire. Having proceeded B.D., Nov. 11, 1628, he took the degree of D.D. June 25, 1634.

In March, 1635, Sheldon was elected warden of All-Souls College; and he was also appointed clerk of the closet to the king. During the civil wars he adhered to the king, and was one of the chaplains sent to attend his commissioners at the treaty of Uxbridge, in February, 1644.

Sheldon was ejected, March 30, 1647, from his wardenship of All-Souls College by the parliamentary visitors, who forcibly took possession of his lodgings, and imprisoned him, with Dr. Hammond, in Oxford and elsewhere. He remained confined above six months, and then the Reforming Committee set him at liberty, Oct. 24, 1648, upon certain conditions. After his release he retired to Snelston in Derbyshire, whence, from his own purse, and from collections made by him amongst the royalists, he sent supplies of money to Charles II. abroad, and followed his studies and devotions until the approach of the Restoration. On that occurrence, he met his majesty at Canterbury; was soon after made dean of the chapel royal; and upon Bishop Juxon's translation to Canterbury, was advanced to the bishopric of London. He also obtained the mastership of the Savoy, which he kept till 1663; and it was at his lodgings there that, in 1661, the famous Savoy Conference was held between some of the Episcopal clergy and some Presbyterian divines.

In 1663 he was translated to the archbishopric of Canterbury, vacant by the death of Archbishop Juxon. In 1665, during the time of the Great Plague, he continued at Lambeth, and by his charity preserved numbers alive who would otherwise have perished. On the removal of Lord Clarendon from the chancellorship of the University of Oxford he was chosen to succeed him, Dec. 20, 1667, but resigned that office July 31, 1669. He died at Lambeth, Nov. 9, 1677.

Sheldon expended large sums upon the Episcopal houses of the sees of London and Canterbury, and particularly the palace at Lambeth, where he rebuilt the library and made additions to its contents. At Oxford, he erected, at his sole expense, the Theatre which bears his name, in which the public meetings of the university are held.

SHELDRAKE, one of the English names for the *Anas Tadorna* of Linnæus, *Tadorna Vulpanser* of Leach and others.

This elegantly-marked duck is the *Tadorne* of the French. It is supposed to be the *Chenalopex* of Herodotus and Pliny ('Nat. Hist.' x. 22): it is the *Kracht-Ente* and *Brand-Ente* of the Germans; and the *Volpoca* of the Italians. The provincial names among the modern British are very numerous, and one of them alludes to its reputation for cunning, which, if it be the bird mentioned by the Greeks and Romans, gave it, most probably, its ancient appellation. It is called in different parts of Britain *Bargander, St. George's Duck, Burrow Duck, Sly Goose, Skeel Duck,* and *Skeeling Goose.*

This species may often be seen about our tidal rivers. Its food consists of small testaceous mollusks, bivalves principally, small fish, fry of fish and spawn, small crustaceans, and marine plants.

Localities:—The northern and western countries of Europe along the sea-coasts; very abundant in Holland and on the coasts of France; accidentally, during its passage, in Germany and on the rivers of the interior. The birds from Japan are identical with those of Europe. (Temminck.)

[Ducks.]

SHELL. The hard calcareous substance which protects either partially or entirely the testaceous mollusks externally, or supports certain of them internally, is termed *Shell.*

This substance, when external, may be considered as the exo-skeleton of the animal; when internal, as its endo-skeleton.

The common or waved Welk of our shores (*Buccinum undatum*), and the common Oyster (*Ostrea edulis*), may be taken as examples of external shells; and the internal support, or cuttle-bone, as it is generally called, of the common Cuttle-Fish (*Sepia vulgaris*), affords an example of an internal shell; for it is not bone, though so termed, but true shell.

Structure.—Shells are either crystalline or granular, according to Mr. Hatchett, who proposed this division in his interesting papers containing his Experiments on Shell and Bone ('Phil. Trans.'), vol. 89 (1799), and his Experiments on Zoophytes ('Phil. Trans.'), vol. 90 (1800).

Crystalline Shells.—The Porcellaneous shells—take a common Cowry (*Cypræa Tigris*) as an example—are crystalline shells.

Crystalline shells are either *rhombic* or *prismatic.*

Those of the *rhombic* crystalline structure, observes Mr. Gray, in his valuable paper 'On the Economy of Molluscous Animals and on the Structure of their Shells' ('Phil. Trans.', 1833), exhibit, on fracture, three distinct layers of calcareous matter. The cubic pieces into which spiral univalves generally break, mostly present, on two of the fractured sides, flat surfaces of the inner and outer edges, separated from each other by a shelving portion in the centre; and, on the two intermediate broken sides, shelving external and internal edges, connected by a flat central portion, these differences of surface being produced by the different position of the crystals in the different layers. 'Each of the three layers,' continues Mr. Gray, 'thus rendered obvious, is composed of very thin laminæ, placed side by side, as high as the thickness of the plate, and perpendicular to its surface. When these laminæ are minutely examined, they will be found marked with obscure oblique lines, in the direction of which they separate when broken into long narrow rhombic crystals. The lines of cleavage in the succeeding laminæ are placed in contrary directions, so that when two of these plates united are examined under the microscope, the lines of cleavage appear to cross each other at right angles, whilst those of the alternate laminæ follow the same direction. The laminæ of the outer and inner plates are always directed from the apex of the cone of which the shell is formed towards its mouth; in the spiral shells they consequently follow the direction of the spire. On the contrary, the laminæ of the plate situated between the other two, form concentric rings round the cone parallel with its base, and cross at right angles those of the inner and outer layer. This decussation of the laminæ of the plates, and of the crystals of the laminæ themselves, adds considerably to the strength of the shell, and accounts for the great difficulty that is found in breaking many shells of this structure, more especially the cones and olives, in which however nearly the whole of the strength resides in the outer whorl and in the spire.'

Shells of the *prismatic* crystalline structure are formed of several layers, sometimes, as in the *Pinnæ*, separated from each other. If however observes Mr. Gray, the shell be cracked transversely to its layers, the crystals will be found continued across the line which separates them; and he alludes to the analogous structure existing in some minerals, Hæmatite for instance, the balls of which appear to be formed of separate concentric coats, but nevertheless, when they are broken, exhibit the crystals radiating from the centre to the circumference without interruption.

If a prismatic crystalline shell be broken, a number of short fibres perpendicularly to the surface appear: these, on examination, prove to be hexagonal prisms principally, and interposed among these are a few smaller polyhedral prisms. The tubes of the great Sumatran *Teredo* and *Magilus* are examples of this structure; and the *Mytili*, *Meleagrinæ*, and *Inocerami*, as well as the *Pinnæ*, may be selected with advantage from among the bivalve shells for observing it.

Granular or *Concretionary Shells*, when fractured, display a texture which is nearly uniform. The plates of which they are formed are very thin, and closely applied to each other; thus making the whole fabric compact and hard. Mr. Gray, after noticing that the pearly or iridescent lustre appears to be confined to shells of this texture, states that he is induced to believe that this lustre depends in great measure on the thinness and number of the laminæ of which the shell is formed. The *Placunæ* and *Anomiæ* exhibit this structure throughout their shells, and it is present in the inner or pearly coating of the *Turbines*, *Haliotides*, and *Uniones*, as well as in the *Pinnæ* and *Meleagrinæ*. In some shells of this structure, as Mr. Gray observes, the layers are thicker, and the animal matter is deposited in larger quantities, thus presenting a foliaceous appearance; and in these the calcareous particles are large, opake, white, and earthy, like chalk. The common oyster is a good example of this modification. Mr. Gray remarks that the animal matter between the laminæ is sometimes very unequally deposited, and notices its occurrence in the form of large brown spots in the pearly coat of many of the *Haliotides*, producing beautiful variations in the colouring and pearliness of the shell.

For a dissertation on the chemical analysis of shells, see Mr. Hatchett's papers in the 'Phil. Trans.' above referred to.

'The greater part, if not all, of marine shells,' says Mr. Hatchett, 'appear to be of two descriptions in respect to the substance of which they are composed. The shells of one division have a porcellaneous aspect, with an enamelled surface, and when broken are often, in a slight degree, of a fibrous texture. The shells of the other division have generally, if not always, a strong epidermis, under which is the shell, principally or entirely composed of the substance called *Nacre*, or Mother-of-Pearl.

In the porcellaneous shells, such as the *Cyprææ*,

&c., Mr. Hatchett found the animal matter combined with the lime to be much less in quantity than in the species composed of nacre.

For an account of the growth of shells, see Mr. Gray's paper in the 'Phil. Trans.' 1833.

SHELL, a hollow globe of iron, containing gunpowder, which is introduced at an orifice formed in the ball. In this orifice is driven or screwed the fuze or tube containing the composition by which the powder in the shell is ignited [FUZE]; and the shell, after being discharged from a gun, howitzer, or mortar, is consequently made to burst in pieces when it falls upon or near the object to be destroyed.

SHELLEY, PERCY BYSSHE, was the eldest son of Sir Timothy Shelley, Bart., of Castle Goring in Sussex. He was born in Field Place, Sussex, Aug. 4, 1792. At the age of thirteen he was sent to Eton, where however he gained no distinction, though he proved himself a tolerably good scholar by translating several books of Pliny's 'Natural History.'

In 1808 he went to Oxford. During his last term there he published a pamphlet with the startling title of 'The Necessity of Atheism;' the consequences of which were, expulsion from college and a quarrel with his family. He now came up to London. It was about this time that his poem of 'Queen Mab' was completed. He never published it; and having had only a few copies struck off for private circulation, he was much annoyed when a piratical bookseller published it. He endeavoured to stop its publication, but without effect. When Shelley had rejected the established religion, and in some degree the ethical creed of his contemporaries, he adopted a system more consonant to his views. This he found in Godwin's 'Political Justice,' from which Shelley drew the resolution 'to square all his actions by what he conceived to be the strictest justice, without any consideration for the opinions of others.' Shortly afterwards, by his marriage with Harriet Westbrooke, the daughter of a coffee-house keeper, he completed the exasperation of his father, who entirely abandoned him. He had two children by her, but at length the want of sympathy, the misunderstandings, and some other more serious matters which intervened, occasioned a separation. She took the children; he allowed her a sufficient income, and in 1814 went abroad to recruit his health.

An account of this trip has been given in a charming little volume called a 'Six Weeks' Tour through a part of France, Switzerland, Germany, and Holland,' reprinted in his 'Letters and Essays.' The next eighteen months he passed in London. In May, 1816, Shelley again visited the Continent, and at Sécheron, near Geneva, he met with Lord Byron, and they formed a close intimacy. Early in July they went on a tour to Mellerie, Clarens, Vevai, Lausanne, Chamouni, Montauvert, Mont Blanc, &c. The summer of 1817 he spent on the Lake of Como.

In November, 1817, when Shelley was at Bath, the news reached him of his wife's suicide; and shortly afterwards he was deprived of the care and education of his children by an order of Lord Chancellor Eldon. The grounds of the petition upon which the order was made, were that he had avowed himself an atheist, and intended to bring up his children in his own principles. In the case of Shelley v. Westbrooke (as reported in Jacob's 'Reports,' p. 266), the petition states that Shelley deserted his wife and cohabited with another woman, and that the children had been supported by their mother and her father from the time when the mother returned to her father's house.

Shelley subsequently married Mary Wolstonecraft Godwin, daughter of Godwin and Mary Wolstonecraft. They retired to Great Marlow in Buckinghamshire, where he distinguished himself by his active benevolence. In fact he actually studied medicine and walked the London hospitals in order that he might attend the sick in his neighbourhood. At Great Marlow he wrote 'Alastor' and 'The Revolt of Islam.' They are pregnant with his peculiar views and hopes for humanity, and they contain much beautiful versification.

Early in 1818 Shelley and his family left England for Italy. During his residence there, besides enriching his mind with the master-works of art, he began the study of Calderon, some fragments of whose 'Magico Prodigioso' he translated with rare felicity. He there produced in rapid succession his 'Prometheus Unbound;' 'Cenci;' 'Hellas;' 'Julian and Maddalo;' 'Epipsychidion,' &c.

In July, 1822, while crossing the Gulf of Spezia, with his friend Edward Elleker Williams in a little pleasure-boat, they were overtaken by one of those tremendous squalls common to the Mediterranean, and were drowned. Shelley's remains were burnt by Lord Byron, Leigh Hunt, Trelawney, and one or two other friends, and then conveyed to Rome, where they were interred close to those of his friend the poet Keats.

Shelley's translations from the Greek are exquisite, and drew loud praises from the 'Quarterly.' His version of 'Faust,' a fragment of which is published, though admirable in spirit and effect, is not faultless with regard to the sense.

SHENKURSK. [ARCHANGEL, *Province.*]

SHENSTONE, WILLIAM, was born, November, 1714, at the Leasowes, Hales Owen, Shropshire. He was sent to Pembroke College, Oxford, in 1732, but took no degree. He amused himself in travelling about and writing poetry till 1745, when he commenced residing on his patrimony at his native place. The remainder of his life was spent in adorning his grounds at the Leasowes, and in rural occupations. He died Feb. 11, 1763. His poems consist of elegies, pastorals, odes, &c. 'The Schoolmistress' is the best of his productions.

SHEPPEY, ISLE OF. [KENT.]

SHEPTON MALLET. [SOMERSETSHIRE.]

SHERARD, WILLIAM, better known as the patron and fellow-labourer of other botanists than by his own writings, was born at Bushby in Leicestershire, in 1659. He received his early education at Merchant Taylors' School, London, and was entered as a student of St. John's College, Oxford, in 1677, and became a fellow of the same college in 1683. He was travelling tutor suc-

cessively to Charles, second Viscount Townshend, and to Wriothesley, Lord Howland, son of Lord Russell who was executed. During this period of his life he made two tours on the Continent, in Holland, France, Italy, &c.; and then made the acquaintance of Boerhaave, Hermann, Tournefort, Vaillant, Micheli, and of most others of the ablest botanists of the time.

In 1702 he was appointed British consul at Smyrna, having previously been one of the commissioners for the sick and wounded at Portsmouth. In 1718 he returned to England, and received the degree of LL.D.

In 1721 he returned to the Continent, and Vaillant, the African traveller, being then in a dying state, Sherard succeeded in transferring the manuscripts and drawings of this great traveller to Boerhaave, who published them in the 'Botanicon Parisiense,' in 1827. In this work Boerhaave was materially assisted by Sherard.

He died in 1728, at the age of 69. At his death he bequeathed his great Herbarium, containing upwards of 12,000 species of plants, to the University of Oxford, and also left 3000*l.* for the purpose of endowing a botanical chair in the same university. This was undoubtedly the greatest service done by Sherard to botany; and although at present it may have produced little fruit, yet the perpetuity of the gift would lead us to anticipate in the future important results.

SHERARDIA, a genus of plants belonging to the natural order *Rubiaceæ*. *S. arvensis*, Corn-Field Madder, is the only species. It is found on sandy soils, in Great Britain, Europe, and the Crimea. The seeds only require to be sown in the ground in an open situation.

SHERBET, a word adopted from the Persian. The French name is *sorbet*, which, as well as the Italian *sorbetto*, and the Spanish *sorbete*, are probably derived from the Latin *sorbere*, 'to sup.' Sherbet, in Persia, Turkey, and other eastern countries where it is chiefly used, is a beverage composed chiefly of water, lemon-juice, and sugar, with the addition of other ingredients to render it more pleasant to the taste, as the pulp of fruits, perfumed cakes, rose water, &c.

SHERBORNE. [DORSETSHIRE.]

SHERBURNE, SIR EDWARD, was born in London Sept. 18, 1618. In 1641 he succeeded his father as clerk of the Ordnance, but was soon ejected as a Roman Catholic and a royalist. He remained firmly attached to the royal cause, and suffered for his adherence until he went to the continent as travelling tutor to Sir John Coventry in 1654, and remained abroad till 1659. On the Restoration he obtained his old situation in the Ordnance, which was again sacrificed at the Revolution of 1688, by his refusing to take the necessary oaths. His conduct however had procured him the honour of knighthood in Jan. 6, 1682. He lived in retirement till his death, which took place at London, Nov. 4, 1702.

Sherburne was the author of poetical translations of two pieces from Seneca, the 'Medea,' and the 'Troades,' published respectively in 1648 and 1679; but his fame principally rests on the translation of 'Manilius,' London, 1675, of which the appendix is especially valuable, as it gives much information regarding Sherburne's contemporaries, not to be met with elsewhere.

SHERIDAN, DR. THOMAS, was born in 1684, in the county of Cavan. His parents were poor; but he was placed by a friend at Trinity College, Dublin. He took orders, and then set up a school in Dublin. Swift procured him, in 1725, a living in the south of Ireland of about 150*l.* a-year. He afterwards changed this living for one in Dunboyne; but speedily gave it up for the free school of Cavan, where he had a salary of 80*l.* a-year besides his scholars. He was through life indolent, careless, slovenly, and indigent. He sold his situation for 400*l.*, alleging as an excuse the 'moist and unwholesome air of Cavan;' but he made no attempt to establish himself elsewhere. This 400*l.* was soon spent, and the 'ill-starred, good-natured, improvident man,' as Lord Cork calls him, fell into sickness and distress, which were terminated by death in 1738.

Lord Cork, speaking of him, says, 'Not a day passed without a rebus, an anagram, or a madrigal. His pen and fiddlestick were in continual motion.' He translated the 'Satires of Persius' into prose, and the 'Philoctetes' of Sophocles into verse; but both are forgotten.

SHERIDAN, THOMAS, M.A., son of Dr. T. Sheridan, was born in 1721, at Quilca, the residence of Swift, who was his godfather. He was sent to Westminster School, as a king's scholar; and afterwards entered Trinity College, Dublin, where he took his degree of M.A. When his father died he was without a profession, and destitute of all expectations; but having conceived an exalted idea of oratory, he determined on its restoration. To this end he devoted himself to the stage. He appeared as Richard III. in Jan. 1743, and met with encouragement.

In 1744 he accepted an engagement at Covent Garden Theatre; and in 1745 he played with Garrick at Drury Lane. He returned to Dublin, and became manager of the theatre there. For eight years he continued his management with success, till in 1754 he unfortunately revived Miller's 'Mahomet.' In this play were many passages respecting liberty, bribery, and corruption, which pleased the anti-courtiers so much that they insisted on those passages being repeated. This being refused on the second night, the audience tore up the benches and boxes, and totally despoiled the theatre. Two years afterwards he resumed the management of the Dublin theatre, and was favourably received, but the speculation was commercially a failure.

He then published a plan for the establishment of an academy for the accomplishment of 'youth in every qualification necessary for a gentleman.' In the formation of this design, he considered the art of oratory to be one of the essentials. The proposal was to some extent carried into execution; but Sheridan had no share in conducting it.

Sheridan however was not a man to be daunted, especially on the question of oratory; and accordingly we find him in 1759 lecturing in England on that subject. He had published an 8vo. volume entitled 'British Education: the source of the

disorders in Great Britain.' The lectures which he composed in confirmation of this theory, and delivered in London, Oxford, and Cambridge, met with immense success: at the last place indeed he was honoured with the degree of M.A. In 1760 he again appeared at Drury Lane, but disagreements with Garrick put a stop to his engagement.

On the accession of George III. a pension was granted him. In Scotland he was honoured with so much attention that a society was formed, called 'The Society for Promoting the Reading and Speaking of the English Language in Scotland.' But when in 1769 he proposed his 'Plan of Education for the Young Nobility and Gentry of Great Britain,' he found the public enthusiasm already cooled: and, finding himself unsupported, he threatened, on the declaration of the American Independence, to 'benefit the New World with the advantages ungratefully neglected by his own country.'

In 1769, 1770, and 1776, he performed at the Haymarket and Covent Garden. He was afterwards manager of Drury Lane for three years. He then produced his 'Pronouncing Dictionary of the English Language.' His 'Life of Swift' followed, a heavy and indiscriminating performance. He died Aug. 14, 1788.

His other works are the 'Course of Oratorical Lectures' and the farce of 'Captain O'Blunder.'

SHERIDAN, FRANCES, wife to the above, was born in Ireland, 1724, but of English parentage, being the grand-daughter of Sir Oliver Chamberlayne. She is uniformly described as a most accomplished and amiable woman. Her 'Nourjahad' has delighted all readers of romance, and her novel of 'Sidney Biddulph' was once popular. She also wrote two comedies, 'The Discovery' and 'The Dupe,' but they are feeble, and are now become rare. She died at Blois, after a lingering illness, Sept. 1766.

SHERIDAN, RICHARD BRINSLEY BUTLER, was the son of Thomas and Frances Sheridan. He was born in Dorset Street, Dublin, Sept. 1751. He was educated at Dublin, and subsequently at Harrow, but was reputed dull as a scholar, although at the age of eighteen he joined his friend Halhed in a translation of the 'Epistles of Aristænetus.'

His first important step in life was his marriage, in 1773, with Miss Linley, which was accompanied by many curious and romantic occurrences. Necessity drove him to literature, and in Jan. 1775, he produced the comedy of 'The Rivals.' On the first night it was damned; but this was chiefly the fault of one of the actors and of those inexperiences which usually attend first nights, and it soon met with the success which it so well deserved.

The farce of 'St. Patrick's Day, or the Scheming Lieutenant,' was produced in the course of the ensuing spring; and the summer of that year was devoted to 'The Duenna,' a very clever opera.

He next became one of the proprietors of Drury Lane Theatre. In 1777 he slightly altered Vanbrugh's 'Relapse,' and produced it under the title of 'The Trip to Scarborough.' In 1777 also he produced 'The School for Scandal,' of which Leigh Hunt remarks, 'With the exception of too great a length of dialogue without action in its earlier scenes, it is a very concentration and crystallisation of all that is sparkling, clear, and compact, in the materials of prose comedy.' In 1779 he wrote the 'Critic,' one of the wittiest farces in the language.

Sheridan's political career was illuminated by a few bright flashes of eloquence and perpetual wit, but he had neither the depth nor the perseverance of a statesman. He had made the acquaintance of Fox, through whose good offices he got elected for the borough of Stafford in 1780. Under the Rockingham administration he became under-secretary of state, but resigned on the death of the marquis. His celebrated speech on the occasion of Warren Hastings's trial was described by all who heard it as a marvellous effort of eloquence.

In 1792 Sheridan's wife died; and in 1795, being then in his forty-fourth year, he married Miss Ogle, the Dean of Winchester's daughter. After an interval of nine years since his last play, he again, in 1798, contributed to the stage the 'Stranger' and 'Pizarro,' both adaptations from Kotzebue. Sheridan's theatrical career terminated with these pieces; and now his prospects seemed every day more lowering. His difficulties, always great, became now insupportable from the want of health, youth, and animal spirits to prompt him to fresh exertions, or to enable him to bear them with better grace. He lived in a perpetual but inefficient struggle. His friends (among them the Prince-Regent) had forsaken him, now that sickness and distress had enfeebled the brilliancy and animation of his conversation. Money was no longer to be borrowed; duns were no longer to be pacified with promises; everything was indicating ruin, and he died near his dying wife, amidst the threats of bailiffs, and deserted by all but his physician, Dr. Bain, and his friends Mr. Rogers, Mr. Thomas Moore, and Lord Holland, July 7, 1816, in Saville Row, London.

SHERIFF, the Shire-Reve (scyr-gerefa), from the Saxon word *reafan*, 'to levy, to seize,' whence also *greve*. The German word is *graf*. In the Saxon period he represented the lord of a district, whether township or hundred, at the folkmote of the county; and within his district he levied the lord's dues, and performed some of his judicial functions. He was usually elected by the freeholders of the district; and, accompanied by four of them, was present on its behalf, as well as on the lord's, or at the folkmote or county court. In like manner the Saxon prince or king employed in the shires or larger districts his gerefa or reve, who levied his dues, fines, and amerciaments; to whom his writs were addressed; who exercised on his behalf regal rights in the shire, for the preservation of the peace and the punishment of offenders; presided over the courts-leet or views of frank-pledge, and (at least in the absence of the earl in ancient times, and since the Conquest instead of the earl) presided over the hundred and county courts. It is difficult to determine how far the functions of the sheriff were concurrent with, and how far derived from, the

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ealderman or earl of Saxon and Danish times; and the confusion between these offices has been increased by the translation, in our ancient laws, of the word sheriff in the Latin into *vice comes*, and in Norman French into *visconte* or *viscount* (deputy of the earl); whereas certainly many of the sheriff's powers, even in Saxon times, were derived from the freeholders, or from the crown alone, and the word graf (gerefa) in German was equivalent to our earl. Before and for a century after the Conquest, the sheriff had powers independent of the earl.

The statute 28 Edward I. c. 8, which says that 'the king hath granted unto his people that they shall have election of their sheriff in every shire (where the sheriff is not fixed in fee) if they list,' is rather declaratory of the people's right than a grant of a new privilege.

At present the crown in most cases annually appoints the sheriffs, and also fills up any vacancy which is occasioned by the death of a sheriff during his year of office. To some corporations of cities which are counties of themselves charters have given the power to elect their own sheriffs; and the city of London has the perpetual right to elect the sheriff of Middlesex. In the county of Durham the bishop was sheriff until he was deprived of palatine powers in 1836; and in Westmorland the office was hereditary in the family of the earl of Thanet as heir-general of the Viponts, to whom the shrievalty was granted by King John; this family is now extinct in the male line.

The sheriff derives his authority from two patents, one of which commits to him the custody of the county, and the other commands the inhabitants to aid him. He takes an oath of office, the greater part of which relates to his collection of the crown revenue, and he gives security to the crown that he will duly account for it. He then appoints an under-sheriff, by whom in fact the duties of the office are performed. These duties are various and important. He presides in his own court as a judge, and he not only tries all causes of 40*s.* in value, but also much larger questions under the writ of Scire facias. By Magna Charta he is prohibited from holding pleas of the crown. He presides at all elections of members of parliament for the county and coroners. He apprehends all wrong-doers. He defends the county against riot or rebellion, or invasion, and to this end may require the assistance of all persons in it who are more than fifteen years of age, and who, when thus assembled under the sheriff's command, are called the *posse comitatûs*. The sheriff takes precedence of all persons in the county. He seizes all lands which have fallen to the crown, and levies all fines and forfeitures; but he is not permitted to act as a justice of the peace. He executes all writs that issue from the superior courts, whether they are writs that commence an action or writs of execution; he is likewise responsible for the execution of criminals. He receives and entertains the judges of assize, on whom he is constantly in attendance whilst they remain in his shire.

To assist him in the performance of his duties, the sheriff employs an under-sheriff and also a bailiff and gaolers, from whom he takes security for their good conduct. He is prohibited by very ancient statutes from selling his office or the profits of any part of it.

The liability of the sheriff for breach or neglect of his duties is a frequent source of litigation. There are many treatises concerning the office, of which Dalton's 'Office and Authority of Sheriff' (1682), is the most relied on.

(Spelman's *Glossary*, articles, 'Graphio,' 'Comes,' 'Vice-Comes;' Coke *upon Littleton*, Hargr. and Thomas's edition, vol. i.; Bacon's *Abridgment;* Palgrave's *Rise and Progress of the English Constitution*, i.)

SHERIFF (*Scotland*). In Scotland the sheriff exercises an extensive judicial authority, and a large portion of the general litigation of the county proceeds before this class of local judges. (See the article 'Sheriff (Scotland)' in the 'Penny Cyclopædia.')

SHERLOCK, WILLIAM, D.D., was born in Southwark about 1641, and studied at Peter House, Cambridge. At an early period of life he had the living of Saint George, Botolph Lane, London. In 1681 he obtained the prebend of St. Pancras, in St. Paul's; and in 1684 or 1685 was elected master of the Temple. He died in 1707.

Dr. Sherlock was much occupied in the theological controversies of the time, of which the most remarkable was that with Dr. South on the nature of the Trinity. His writings are numerous; 'A Practical Discourse concerning Death,' was once a popular book.

SHERLOCK, THOMAS, son of Dr. William Sherlock, was born in London in 1678, and educated at Eton, whence he passed to Catherine Hall, Cambridge, of which college he became master, and in 1714 was vice-chancellor of the University. In 1704 he had been made master of the Temple, on the resignation of his father. His political conduct was thought to be ambiguous at the beginning of the reign of George I., but he soon gave in his adhesion to the new family, and in Nov. 1715 was made dean of Chichester. His conduct in the Bangorian controversy was however so offensive at court that he was removed from the list of king's chaplains in 1717. In the controversies which arose at that period respecting the proofs of the divine origin of Christianity, Dr. Sherlock took an active part; and his 'Trial of the Witnesses of the Resurrection of Jesus' is a masterly reply to the objections of those who reject the evidence of miracles. In 1727 he was made Bishop of Bangor, and was translated to Salisbury in 1734. In 1747 the archbishopric of Canterbury was offered to his acceptance, but declined by him on account of the state of his health. In the next year however he accepted the bishopric of London. In 1753 he resigned the mastership of the Temple. In 1755 and 1756 he revised and corrected a large body of his sermons, which were published in four octavo volumes, to which a fifth was afterwards added. He died in 1761.

SHERWIN, JOHN KEYSE, was a native of Sussex, of very humble origin. When about

eighteen or nineteen, while employed as a wood-cutter on the estate of Mr. Mitford, near Petworth, he produced a drawing which was sent to the Society of Arts, and obtained their silver pallet as a reward. He then removed to London, and became a pupil of Ashley, a painter, and afterwards of Bartolozzi the engraver. He carried off both the silver and gold medals from all the students of the Royal Academy. In 1774 and 1775 he received two prizes of twenty guineas each from the Society of Arts for engravings from designs by himself, and in 1778 he obtained their gold medal for excellence in engraving. On the death of Woollett, in 1785, Sherwin was appointed engraver to the king. Although he displayed considerable talent in design, it is as an engraver that his reputation stands highest. He died Sept. 20, 1790.

SHETLAND ISLES are the most remote and northerly group of islands incorporated with Great Britain. They are situate about 150 miles from the headland of Buchanness on the Aberdeen coast, and are nearly 100 miles beyond the centre of the Orkney Islands. Excluding the two more detached islands of the group, called Foula and Fair-Isle, the Shetland Isles lie between 59° 48′ and 60° 52′ N. lat., and between 52′ and 1° 57′ W. long. Foula is 20 miles W. of the Mainland of Shetland, and Fair-Isle 25 miles S.S.W. of the nearest headland of the Mainland.

The Shetland group consists of ninety islands, islets, holms, and skerries, about thirty of which are inhabited; the others are either small verdant isles, on which cattle and sheep are pastured, or sterile masses of rock. The largest of the Shetland Isles, called the Mainland, is about 55 miles long. The breadth varies from 3 to 10 miles, and at one part is 24 miles. The coasts of the Mainland are singularly irregular and broken, being indented with innumerable arms of the sea, or deep bays, universally distinguished by the provincial term of 'Voes,' which penetrate into and intersect the interior parts of this island in a singular manner. The next largest island is Yell, being about 20 miles in length and 6 in breadth. Unst is the third largest island, and is about 11 miles long and 6 miles broad. The other islands are comparatively small.

The Shetland Islands are included in the county of Orkney and Shetland. [Orkney Islands.] The population of the Shetland Islands in 1841 was 30,558.

The general appearance of the Shetland Islands, as seen from sea, is a heavy and unvarying line of abrupt coast. Roeness Hill, with an altitude of 1500 feet, is the highest hill in the Mainland and of Shetland. The surface of the islands is particularly rugged and wild, and not unfrequently bears the appearance of desolation and sterility. Tracts of cultivated and fertile land, generally near the voes and the sea-coasts, with rich pastures and bright green meadows, are pleasing exceptions to this general character of the country; and the majestic cliffs and towering headlands that frown over the stormy seas, the numerous detached pyramids of rock, and the openings of innumerable lofty caverns, are, either separately or grouped together, very magnificent and highly picturesque features.

The agriculture and rural economy of the Shetland Isles have been at all times conducted in a primitive and rude manner. The culture of the soil is a secondary consideration both to landlords and tenants, who direct their attention chiefly to the prosecution of the valuable fisheries in their neighbourhood; consequently, the small tenants, all of whom are fishermen, have merely a small proportion of arable land, just enough to enable them to raise a scanty supply of food for themselves and their families, and to allow them to devote the best part of their time to fishing.

Dr. Hibbert published, in 1822, 'A Minute Account of the Geology of the Shetland Isles.' The southern part of the Mainland is composed of a ridge of clay-slate lying parallel to secondary sandstone and conglomerate on the one side, and small islands of gneiss and sienite on the other. The centre of the Mainland is a solid mass of gneiss, having bluish gray quartz on the west side, and districts of sienitic greenstone and granite to the north. The island of Yell is formed of gneiss; and Unst is chiefly formed of serpentine and diallage rock. The island of Foula is formed of high hills of sandstone, with clay and mica slate, gneiss, and granite on its north-eastern shores; and Fair-Isle also chiefly consists of sandstone.

This northern region is subject to severe and long-continued storms; and while winter may be said to commence in the month of October, the return of spring is almost imperceptible till the end of April. The climate throughout the year is variable and humid, but to the natives it is decidedly healthy, and instances of great longevity are not uncommon.

In the high latitude of Shetland, the light of day at midsummer never totally disappears, and the smallest print can be read at midnight, when the lingering rays of the preceding day mingle with and give way to the early dawn of the morrow. During winter the nights are proportionally long and dreary; and in the month of December the sun is not above the horizon more than five hours and twenty minutes.

Lerwick the only town in Shetland, and the capital of the Shetlands, stands on Bressay Sound, on the east side of the Mainland. The houses are built close to the water-edge; and the country being destitute of roads and wheeled vehicles, there are no streets, and consequently the town presents a singularly confused appearance, with no other thoroughfare than a tortuous ill-paved path between the houses. It is however a bustling and interesting town, with a thriving and industrious population; possesses many well-supplied shops, and has one of the best harbours in Shetland. The population of the town in 1841 was 2787.

Much learning has been advanced to connect the *Thule* of Tacitus ('Agricola,' c. 10) with Shetland. The prevailing belief now is, that *Thule* is the same as *Foula*, one of the Shetlands, and the only one of them which, from the altitude of its hills and its detached position, might have been seen from the seas immediately to the north of

the Orkneys when the Romans circumnavigated Britain.

In the ninth century Shetland and Orkney became subject to Norway. The country was peopled by Northmen, and their laws, language, usages, and manners were soon firmly established. About the year 1380, a Scottish nobleman, Henry Sinclair, obtained the earldom of Orkney, which included Shetland, from the king of Denmark and Norway, and it continued in his family for about a century under the sovereignty of Norway. In the year 1469 James III. of Scotland married Margaret, the daughter of Christiern, king of Denmark, and with her he was to get a dowry of 60,000 florins, of which it was agreed that 10,000 florins should then be paid, and that the Orkney Islands should remain mortgaged in possession of the Scottish king, until the remaining part of the marriage portion should be paid. The Danish king however only paid 2000 florins, and for the remaining 8000 he further mortgaged the Shetland Isles, which, along with Orkney (as no part of the money was ever paid), have been attached since that time to the kingdom of Scotland. The Norwegian laws and usages however continued in full force in Shetland until a very recent period, together with several rules and customs arising from the detached and peculiar situation of Shetland, which were also respected as laws.

At an early period Shetland was called Hialtland and Yealtland, which afterwards became changed into Yetland and Zetland; and from this last name the late Lord Dundas, one of the leading proprietors in Orkney and Shetland, took the title of Earl of Zetland in 1838, when elevated to that rank in the peerage.

SHEW-BREAD was the name given to the twelve loaves of bread, one for each of the tribes of Israel, which were constantly displayed on a golden table in the holy place of the Tabernacle and Temple. As every part of the Jewish ritual system is typical of some Christian truth or ordinance, perhaps there may have been in the shew-bread a reference to the sacrament of the Lord's Supper.

SHIELD was a part of the ancient armour designed to ward off the strokes of the sword and missiles. Shields were borne on the left arm, and were of different forms and sizes, and they were accordingly designated by different names. Some shields were made of wood or osiers, covered over with hides. The metal shields at least had on the centre of the outer side a projection which the Greeks called 'ómphalos' (navel), and the Latins 'umbo.' The object of this was to cause the missiles to glance off. In the inner side there was a band of metal or leather, extending from rim to rim, by which the shield was hung on the arm. In Homer some shields are described as ornamented with designs, as we may infer from the description of the shield of Achilles in the 'Iliad.' Shields continued to be used by European nations till they were rendered useless by the introduction of fire-arms. [ARMOUR.]

SHIELD, WILLIAM, was born at Smalwell, county of Durham, in 1749, and apprenticed to a boat-builder at North Shields. During his apprenticeship he was encouraged to cultivate his talent as a violinist, and at its termination he devoted himself wholly to the study of music. Having attracted the notice of Avison, the author of the 'Essay on Musical Expression,' he obtained instructions in the principles of composition, and shortly afterwards composed an anthem for the consecration of the new church at Sunderland, which was performed by the choir of Durham cathedral.

This brought him into notice, and he undertook the management of the concerts at Scarborough. He soon went to London, and was engaged as one of the band of the King's theatre, in which he became principal viola, an appointment he retained for nearly twenty years.

Mr. Shield first appeared as a dramatic composer in 1778, when 'The Flitch of Bacon' was performed with great success at Covent Garden. In 1783 appeared 'Rosina,' which is almost universally considered as Shield's best work. The same year was produced the music for O'Keefe's 'The Poor Soldier.' 'Robin Hood,' and 'Fontainebleau' followed shortly afterward. 'Marian,' 'Oscar and Malvina,' 'The Woodman,' and others succeeded. In 1807, having made a continental tour and produced some other works, he retired from all theatrical concerns, and prepared for publication his 'Introduction to Harmony,' a work in 2 vols. 4to., of which a second edition was published in 1817. In 1809 he printed a volume of glees, ballads, &c., under the title of 'A Cento.' In 1817 appeared his 'Rudiments of Thorough-Bass.' In the same year the Prince Regent appointed Mr. Shield to the situation of Master of the Band of Musicians in ordinary to the king, in which capacity he conducted the musical part of the ceremonial in Westminster Abbey at the coronation of George IV. He died in 1829.

SHIELDS, NORTH. [NORTHUMBERLAND.]

SHIELDS, SOUTH. [DURHAM.]

SHIFFNALL. [SHROPSHIRE.]

SHIITES is the name of a sect of heretics among the Mohammedans. It is principally used to designate the sectaries or adherents of Ali Ibn Abi Tálib, who maintain him to be the lawful khalif and imàm, and say that supreme authority, both in spiritual and temporal matters, belongs to his descendants. The Persians are Shiites, and the Turks Sunnites; hence the cause of the schism still subsisting between them, which has been maintained on both sides with ardent zeal and implacable hatred. The chief points wherein they differ may be reduced to three:—1, The Shiites reject Abù Bekr, Omar, and Othmán, the first three khalifs, as usurpers and intruders; whereas the Sunnites respect them as rightful imàms. 2, The Shiites prefer Ali to Mohammed, or at least look upon him as his equal in every respect; whilst the Sunnites admit neither Ali nor even any of the prophets to be equal to Mohammed. 3, The Sunnites receive the *Sunna*, or body of traditions concerning the prophet, as of canonical authority; the Shiites reject it as apocryphal and unworthy of credit.

SHIKARPOOR is a commercial town, in the province of Sinde, in 27° 58′ N. lat., and 68° 30′

E. long. The town is built on the plain, which extends from the banks of the Indus to the Hala Mountains, and about 26 miles from the western bank of the river. Though more than 250 miles from the sea, it is only 250 feet above the sea-level. The walls enclose a space of 3831 yards in circuit. They are built of unburnt brick, but have fallen to decay for want of repairs. They have eight gates. The houses are also of unburnt brick; those belonging to the bankers are of a respectable size, and convenient. The streets are narrow, confined, and dirty. The great bazaar, which is the centre of all trade and banking transactions, extends 800 yards, running immediately through the centre of the city. It is protected from the excessive heat by mats stretched from the houses on each side, which however produces a stagnation of the air. Shikarpoor possesses no building of importance. The suburbs are very extensive, and a great portion of the population who are considered to belong to the city reside outside, particularly the Mohammedans and labouring classes.

The population of Shikarpoor, in 1840, consisted of about 30,000 individuals, of whom about two-thirds were Hindoos, and the remainder Mohammedans, inclusive of Afghans and Patans. The Hindoos carry on all the trade, while the cultivation and mechanical arts of almost every denomination are in the hands of the Mohammedans.

The country round the city is low, and admits freely of irrigation from the inundations of the river Indus by means of small nullas, or watercourses, leading from the Sinde Canal. This canal is only navigable from the end of April to the beginning of October, as it has been allowed to choak up at its mouth, and is out of repair.

A few articles are manufactured at Shikarpoor, but not to any extent, except coarse cotton-cloth and silk-cloth. This town is the centre of a considerable trade. The most convenient commercial road between Hindustan, Afghanistan, and Persia, runs through it, and leads to the Bolan Pass, which, in spite of its formidable aspect, is much safer than the other roads which connect the valley of the Indus with the table-land of Iran, and this safety has been greatly increased since the British have got possession of the province of Sinde.

Shikarpoor is best known in the commercial world by its banking transactions. In 1841 there were in that place 35 bankers, who have agents in all large commercial towns in Western Asia, as far as Bokhara and Yarkand in Chinese Turkistan, and even in Astrakhan and Nishnei Novogrod in Russia. Letters of exchange may be got in all these places payable in Shikarpoor, Bombay, and Calcutta.

The climate of Shikarpoor is sultry, and the heat excessive from the middle of March to the end of August. The cold months commence in September, and last to the middle of March. Frost and ice are not unusual, and vegetation assumes all the appearance of winter in a northern climate. The mornings at Shikarpoor are invariably cold.

Skikarpoor is a new town. It was built by the Mogul Emperor in 1617, and as, during the last century, since the invasion of Nadir Shah (1739) all the neighbouring countries almost without interruption have been in a state of disorder, the town has never had the opportunity of developing all the advantages of its situation. It passed, on the conquest of Sinde, under the dominion of the British. [SINDE.]

SHIP. The origin and progress of the British navy is stated under NAVY, BRITISH.

The most essential conditions in the construction of a ship are, that it be capable of carrying its stores and its artillery or lading; that it be moved by wind or steam with great velocity, and that it readily obey the motion of the rudder; that it have the necessary stability, so as not to be overturned when acted upon by the wind or waves; and finally, that its rolling or pitching be attended with as little strain as possible on the timbers.

In merchant ships an ample capacity is frequently of more importance than a great velocity in sailing; and in this case the relations between the length, breadth, and depth, depend less upon hydrodynamical principles than the corresponding relations in ships of war. With respect to ships of war, it is observed by Mr. Morgan, in his papers on naval architecture, that the number and weight of the guns constitute the basis of the design; for from these the weight of the whole ship, or the volume of the water which it will displace, may be estimated. The distance between the guns on the decks must be such as by experience has been found sufficient for working them; and hence the number of decks being given, the least length which the ship should have becomes known. The breadth also must in part be determined by the artillery; for on each side of the ship, between the hatches or ladder-ways and the rear of the gun-carriages after the recoil, there must be room for a free passage; but this element must also be great enough to afford the necessary stability, that the tendency of a lateral wind to turn the ship about a longitudinal axis may be resisted. The draught of water (the depth to which the ship is immersed) may depend on the depth of water in the harbours and roadsteads; but it should also be determined from experience, so that the ship may be prevented as much as possible from making leeway; and the height of the ship above water must be such that, while the upper tiers of guns are kept as low as possible, the height of the lowest tier above the water, when the ship floats upright, may be not less than six feet, in order that the lower guns may be worked when the ship has considerable inclination. Finally, the form of the body must be that which is most favourable for velocity, by causing the least possible resistance of the water at the bows and along the sides; which allows the greatest lateral resistance, and which will permit the rudder to act with most effect in causing the ship to be turned about a vertical axis. And if, when in the design for a ship all these conditions are fulfilled, the displacement (weight of the volume of water which would fill

the space occupied by the ship below the general surface of the water in which she floats) is equal to the whole weight of the ship, the several dimensions may be considered as nearly correct. Ships carrying 44 and 64 guns on two decks, and 80 guns on three decks, are now no longer constructed, because the proportions between the lengths and breadths, which depend on those numbers of guns, produced vessels having deficient sailing qualities.

Experiments have shown, that when the quantity of sail is the same, the velocity of a ship is increased by increasing the ratio between its length and breadth. The greatest length which may be given to ships of war is a point still undetermined; and the length seems to have hitherto gone on increasing in the navies of all nations. In 1786 was built the Victory, of 100 guns; this was then the greatest three-decker in the British service, and its length was 186 feet. In 1796 the Ville de Paris, of 110 guns, and 190 feet long, was built at Chatham; and in 1809 was built the Caledonia, of 120 guns, whose length was 205 feet.

It has been found that ships having the same proportions possess unequal sailing properties; it may be perceived indeed that a small ship built according to the proportions of a large one which is known to sail well, will not possess the like good quality. On the other hand it may be inferred that a vessel having the same proportions as a good one of smaller dimensions, will be superior to the latter. If two ships carry sails proportional to their stabilities, and if the height of the lower tier of guns above water be the same in both when the ships float upright; then, the inclinations of the planes of their masts being also supposed to be equal, the lower guns of the smaller ship will be farther from the water than those of the larger ship, and, in action, the latter might be in danger when the other would be safe. Consequently, if the greatest possible quantity of sail be given to the smaller ship, a smaller quantity relatively to its stability ought to be given to the larger.

That a ship whose hull has been constructed according to the best rules of art does not always fulfil the conditions required, may depend on several causes. The blocks, ropes, &c. may be too heavy, and the sails may be badly formed. If the burthen is placed too low, the rolling will be heavy, and the masts may be endangered; on the other hand, if the burthen is too high, there may not be sufficient stability. If the burthen is too near either of the extremities, the pitching motion will be violent, and the velocity will be consequently diminished. Lastly, through unskilfulness the sails may not be properly set with respect to the direction of the wind and of the ship's path, so that the force of the wind to propel the ship may be less than it would otherwise be, or the ship may be incapable of going about.

The discovery of the elements on which depend the stability and the sailing properties of ships will probably be made rather by studying the proportions of such as from experience have been found to possess the desired qualities, than by purely scientific researches; and as a step preparatory to this study it will be necessary to be acquainted with the methods by which, in a body like a ship, which cannot be considered as corresponding to any geometrical solid, the areas of sections, the volume of the whole or of the part immersed in the water, the position of the centre of gravity of the hull or the sails, &c., are found. An account of these preparatory methods, and also a general statement of the mathematical principles of naval architecture, are given in the article 'Ship,' in the 'Penny Cyclopædia,' in which work the mechanical construction of ships is also stated in the article 'Ship-Building.'

Vessels of iron are now very frequently constructed both for rivers and for navigation in the open seas, and they have many advantages over ships of wood. They are much lighter, or more buoyant. They are less liable to become arched, and are better able to withstand the effects of striking upon a rock. In the latter case, a ship of wood would have its bottom pierced, or it might go to pieces, while the iron one would merely become indented. They are formed with rib-frames at intervals, and with longitudinal hoops of iron; and they are covered with iron plates, which are fastened to the ribs by bolts or rivets. The lower part of the interior may be divided into compartments, which can be rendered air-tight; and thus, in the event of the bottom being perforated in any place, the water would be confined within that compartment till the damaged plate could be repaired or replaced.

The sheathing of ships at first consisted of a second covering of planks applied on the exterior of the first, over the bottom and sides as far as they were under water; but this being found to impede the motion of the ship, a sheathing of milled lead (the invention of Sir Philip Howard) was subsequently employed. The application of plates of copper as a covering on the exterior of ships was first tried in 1760; and in 1783 all those belonging to the royal navy were ordered to be covered or sheathed with that metal. By this practice shells and sea-weeds are prevented from adhering to the sides and bottoms; the friction of the water against them is diminished, and the damage which would be caused by worms is avoided. Owing to the great expense of copper sheathing, which has the effect of limiting its use in mercantile shipping, many attempts have been made to substitute for it either other metals, or alloys in which it is mixed with cheaper metals, such as lead, or with such as might increase its durability, as zinc. Iron, protected by the galvanic action of zinc, has been used. Sheathing of brown paper coated with tar, and a kind of felt, into the composition of which a considerable quantity of cow-hair enters, have also been tried.

Copper sheathing is usually applied in sheets about 4 feet long and 14 inches wide, the thickness being such that a square foot weighs from 16 to 32 ounces, but most commonly from 20 to 28 ounces; and the mode of application does not vary materially, whether the copper be laid upon the bare planking or upon an interposed layer of

tarred paper, felt, or thin boarding. The sheets are pierced with holes, not only round the edges, but also at intervals of three or four inches over the whole surface; they are laid so as to overlap each other about an inch, and are secured to the ship with flat-headed copper nails. An East Indiaman requires re-coppering after two voyages; and the old copper is found to have lost three or four ounces of its weight in the square foot, by the action of sea-water, friction, and other causes.

The stability of a ship depending much on its breadth, and the lateral action of the wind on the sails being the force to which the stability is opposed, it follows that the heights of the masts or sails, and that of the common centre of gravity of the latter, ought to vary with the breadth of the ship; while the breadths of the sails must vary with its length. Now the momentum of the wind in the sails depending upon the breadth and height of the sails, and upon the place of their centre of gravity, that momentum must vary with the length of the ship and the square of its breadth; hence, in small ships, it is less proportionally to the stability than in great ships; and, on this account, the heights of the masts in the former are generally less in proportion to the breadth than in the latter.

The shrouds and back-stays are intended to enable the masts to resist the pressure of the wind when it acts in any direction aft of the beam: they are made fast to the sides of the ship at what are called the 'channels,' which are always rather aft of the mast to which they belong, in order that the action of the wind against the sails may be better resisted; and the 'dead-eyes' allow the shrouds to be relaxed or made 'tort,' as circumstances may require. The main and mizen masts are always made to rake, or incline aft; but the fore-mast is usually upright. The fore-stay and the main-topmast-stay should be in one line; so also should the main-stay and the mizen-topmast-stay. These stays serve to keep the masts steady, and resist the pressure of the wind when its direction is before the beam, as well as the strain produced by the action of the men on the braces.

The masts of ships are built of several pieces selected from the strongest parts of trees, and attached together both in the fore-and-aft and in the athwart-ship directions, the whole being bound together by hoops at intervals. Usually the central piece consists of one log of timber reduced to the form of a polygonal prism, and to the sides of this are applied other pieces, which are connected with it either by a longitudinal projection in each, which is let into a corresponding channel made in the central piece, or by blocks of hard wood which are let into both the central and attached pieces. In order that masts may more effectually resist the strain of torsion to which they are subject, it is sometimes the practice to form one of the surfaces, in each of two timbers which are to be applied together, in prismatic 'tables,' alternately elevated and depressed; so that when those surfaces are applied together, the raised parts in each may fit the depressed parts in the other.

The rudder serves to govern the ship's motion; for, on being turned so that its plane is in a position oblique to the plane of the masts and keel, the reaction of the water against it as the ship advances, being resolved in a direction perpendicular to the last-mentioned plane, becomes a force which causes the ship to turn upon a line passing through its centre of gravity. Thus by giving the rudder more or less inclination to the said plane, the ship may be made to move in any required direction, or may be made to avoid an object by which its safety might be endangered.

Ships have different designations, according to the number of their masts or the disposition of their sails. The word *Ship* is more particularly applied to those vessels which have a fore, a main, and a mizen mast, with a top-mast and top-gallant-mast to each; and in which the yards, in sailing before the wind, are braced square, that is, in horizontal positions perpendicularly to the length of the ship: the mizen sail alone being usually in a fore-and-aft position, that is, in a vertical plane passing through the keel. A *Bark* is a vessel with masts and sails like those of a ship, except that the mizen-mast carries no top-sail or top-gallant sail. A *Brig* has a fore and a main mast, with top and top-gallant masts and sails, like those of a ship; but it has no mizen-mast, and the main-sail has a position corresponding to that of the mizen-sail in a ship with three masts. A *Snow* is rigged in the same manner as a brig, except that the main-sail is attached to a small mast abaft of and very near the main-mast. A *Schooner* has two masts, and the sails attached to them are, in their usual position, in vertical planes passing through the keel: it has small or no top-sails. Lastly, a *Sloop* (shaloop) has only one mast, with a main-sail, whose plane is usually in a fore-and-aft position. Each of the different kinds of ships has a bowsprit which carries a fore-stay-sail and a jib-sail.

In the British navy, ships which carry 70 or a greater number of guns are called *Line-of-Battle Ships*. *Frigate* is a term which is supposed to have been first applied to a light galley moved by sails or oars; but it is now applied to ships of war, generally with two decks, and carrying from 36 to 60 guns. These are built narrower than line-of-battle ships in proportion to their length, and sail swiftly. They accompany fleets in order to watch at a distance the movements of the enemy, and they act singly against ships of a like kind. Ships of war of a lower class than frigates have the denominations of Sloops, Corvettes, Brigs, Cutters, Brigantines, Ketches, Schooners, and Barks. The Sloops of War and Corvettes carry from 4 to 20 guns, and some brigs carry 16 guns. The number of guns in a vessel of either of the remaining classes does not exceed 10.

The tonnage of a ship is, properly, an expression for the interior capacity by the number of tons of sea-water which it could contain; therefore, if the interior volume were found in cubic feet, on dividing that volume by 35 (the number of cubic feet of sea-water which are equal in weight to one ton), the quotient would be the tonnage required. The tonnage however is frequently understood to

express the capacity by the number of tons of sea-water which might be contained between a horizontal plane passing through the ship when she floats in still water with only her equipments and stores on board, and a horizontal plane passing through the ship when laden; the volume of that part of the ship expressed in cubic feet being divided by 35, as in the other case. This result evidently gives the weight of the ship's cargo merely.

SHIPS. The law of England relating to merchant ships and seamen is partly founded on principles of maritime law common to the whole civilised world, and partly on acts of parliament. The subject may conveniently be divided into four parts:—

1. That relating to the ownership of ships and its incidents.

2. To the persons employed in the navigation, &c., of merchant ships.

3. To the carriage of goods and passengers in merchant ships, the rights and duties, &c., of freighters and passengers, of owners and their servants.

4. To the employment and wages, &c., of merchant seamen.

1. A ship belongs to those at whose expense it has been built, but it may pass into other hands by purchase, by the death or bankruptcy of the owners, or by capture by an enemy. The general law relating to chattels applies to ships with certain modifications. The property in a ship is now always proved by written documents; and by means of these the property in any ship may be conveyed. But when actual possession is possible, a delivery of it is also necessary to convey a perfect title; otherwise, in the case of the bankruptcy of a seller who is allowed to remain in possession, the property may vest in the assignees. Previous to the passing of the registry acts, 4 Geo. IV. c. 41, and 6 Geo. IV. c. 110, 3 & 4 Wm. IV. c. 55, the same consequences might have ensued from the continued possession of the original owner, in the case of ships mortgaged or conveyed to trustees for the payment of debts. But by the 42nd and 43rd sections of the last act, provisions are made for a statement of the object and nature of the transfer in the book of registry, and for indorsement on the certificate of registry, by which such consequences are prevented. Enactments to the like effect are made in the bankrupt act, 6 Geo. IV. c. 16, s. 72.

In order to complete a title by capture, it is necessary that a sentence of condemnation should be obtained in a court of the nation by whom the capture has been made. [PRIZE.]

If repairs have been done, or necessaries supplied to a ship, the legal owners, upon proof of their title to the ship, are primâ facie presumed to be liable. But this presumption may be rebutted by proof that they were done or supplied under the authority and upon the credit of another.

A variety of privileges of trade are confined to ships either of British build, or taken as prizes in war, &c. The first statute passed with a view to effect this object was 26 Geo. III. c. 60. The 4 Geo. IV. c. 41, 6 Geo. IV. c. 110, 3 & 4 Wm. IV. c. 55, and 8 & 9 Vict. c. 89, which consolidated the previous statutes, were subsequently passed for the same purpose. The registry of a ship is not compulsory; the only consequence of non-registry is, that a non-registered ship can enjoy none of the privileges of a British ship. No ships can be registered which are built elsewhere than in the United Kingdom or in some of its colonies or dependencies, or have been condemned as prize, &c., or as forfeited for breach of the laws relating to the slave-trade. All natural born subjects of the British crown, all denizens, all persons naturalised by act of parliament, and certain other classes of persons, are qualified to be owners or part owners of British registered vessels. (12 & 13 Vict. c. 29.) A registered ship may cease to enjoy the privileges of British ships, by sale under the decree of a court for benefit of the owners in consequence of being stranded, and by capture. But the 12 & 13 Vict. c. 29 repeals so much of the 8 & 9 Vict. c. 89 as provides that no ship or vessel shall be registered except such as are wholly of the build of some part of the British, dominions; and so much as relates to the disqualification of ships repaired in a foreign country; and so much as prevents British ships which have been captured by or sold to foreigners from becoming entitled to be again registered as British, in case the same again become the property of British subjects. Every ship is considered to be divided into 64 equal parts, and no individual or partnership firm can be registered as owner or owners of less than a 64th part. Proper officers, who generally are the officers of customs on the spot in question, are appointed for the purpose of making the registry and granting certificates of registry to the owners. When the property in a ship or any part of it is transferred, it must be done by a bill of sale, which recites the contents of the certificate. The property in the ship is not conveyed until the instrument has been produced to the proper officer at the port where the ship was registered or is about to be registered afresh. The officer then makes a registry in accordance with the altered circumstances of ownership, and indorses them on the certificate; of this he must give notice to the commissioners of customs. The transfer is rendered complete by an indorsement on the bill of sale certifying the entry in the registry and the indorsement. If the master of a ship is changed, notice of it must be given to the proper authorities, and a memorandum and indorsement of the change must be made in the registry and on the certificate. The only conclusive evidence of ownership of a ship is the registry and certificate; but a production of the registry alone is not even primâ facie evidence to render a party liable as owner of a ship.

If a ship is the property of several part-owners, the law provides for the administration of the joint property in case of a disagreement as to the management among the joint-owners. The majority in value are authorised to employ the ship 'upon any probable design;' but they are only entitled to do so upon giving security to the minority in a sum equal in value to the united shares of the latter. One part-owner may make

the others liable for repairs, &c., done at his order: the usual practice however is for the part-owners to unite in appointing one person as a general agent for them all. This person is styled the Ship's Husband, and his duty, when not specially defined, is to attend to all matters connected with the outfit and freighting of the ship.

2. The *Master* is the commander of the ship; he has the sole management of it. He is responsible for any injury done to the ship or cargo in consequence of his negligence or incompetence. No ship is a British ship unless duly registered and navigated as such. The master of a British ship must be a British subject, and three-fourths of the crew must be British seamen; but to this rule there are some exceptions and limitations. (12 & 13 Vict. c. 112, s. 7.) This act also defines (s. 8) what persons shall be deemed to be British seamen, or to be duly qualified to be masters of British vessels.

The master can bind the owners by entering into engagements relative to the employment of the ship. Such engagements are of two kinds:—1. A contract by which the whole ship is let to hire during an entire voyage, which generally is accomplished by a sealed instrument called a charter-party. 2. A contract with distinct persons to convey the goods of each, in which case the ship is called a general ship. If the charter-party is made in the name of the master only, it will not support a direct action upon it against the owners. Still, if the contract is duly made, and under such circumstances as afford either direct proof of authority or evidence from which such authority may be inferred, the owners may be made responsible either by a special action on the case or by a suit in equity. The master can also render the owners liable for repairs done and provisions and other things furnished for her use, or for the money which he has expended for such purposes. In this case also the remedy of the creditor is against the master, unless by express contract the owners alone are rendered liable, and also against the owners. A party who has done the repairs upon a ship has a right to retain the possession of it until his demands are paid; but if he gives up possession, he is on the same footing as other creditors. When however the ship is abroad, and the necessary expenses cannot otherwise be defrayed, the master has power to hypothecate the ship and freight as security for debts contracted on behalf of the ship. The contract of hypothecation is called a contract of bottomry, by which the ship upon its arrival in port is answerable for the money advanced, with such interest as may have been agreed on. [Bottomry.] By such hypothecation the creditor acquires a claim on the ship. If the necessary amount of money cannot be raised by hypothecating the ship and freight, the master may also sell part of the cargo or pledge it.

The 7 & 8 Vict. c. 112, entitled 'An Act to amend and consolidate the laws relating to Merchant Seamen and for keeping a Register of Seamen' repeals the 5 & 6 Wm. IV. c. 19, except so far as such act repeals the acts thereby repealed, and except so far as relates to the establishment, maintenance, and regulations of the office called 'The General Register Office of Merchant Seamen.' This new act contains the regulations as to the hiring of Seamen, their rights and duties. The 37th section of this act is repealed by 12 and 13 Vict. c. 29.

3. The contracts under which goods are conveyed in a ship are the contract by charter-party and the contract for their conveyance by a general ship. A *charter-party* is 'a contract by which an entire ship, or some principal part thereof, is let to a merchant for the conveyance of goods on a determined voyage to one or more places.' A charter-party is a written instrument, generally, though not necessarily, under seal, which is executed by the owners or the master, or the owners and the master of the one part, and by the merchant or his agent of the other part. The word charter-party is derived from two words *charta partita*, 'divided charter,' because the duplicates of the agreement were formerly written on one piece of paper or parchment, and afterwards divided by cutting through some word or figure so as to enable each party to identify the agreement produced by the other.

The owner of the ship has always a lien on the goods in the ship, when the freight is to be paid before or on the delivery at their place of destination of the goods, or even, as Lord Tenterden himself decided (2 Barn. and Ald., 603), where there is 'nothing to show that the delivery of the goods was to precede the payment of that hire.' All difficulties may be avoided by inserting a clause in the charter-party which shall state whether it is meant that the owner should have a lien upon the lading for his freight and expenses. The owner does not lose his right of lien by depositing the lading in a public warehouse, provided he gives notice that it is to be detained until his claim for freight is satisfied.

As to Demurrage, see that article.

When a ship or a principal part of it is not let out by charter-party, the owners contract with several merchants respectively for the conveyance of their goods. A ship so employed is called a general ship. The terms of the contract appear from the instrument called a Bill of Lading.

The master has authority over the passengers as well as over the crew. If a passenger thwart the master in the exercise of his authority, or otherwise misconduct himself, he may be put under restraint or imprisoned. If a passenger feels himself aggrieved by the manner in which he has been treated, he may bring an action against the master. Several statutes have been passed to regulate the conveyance of passengers. The 6 Geo. IV. c. 116, relates to ships carrying passengers from places in the United Kingdom to places out of Europe, and not within the Straits of Gibraltar. Ships in the service of the crown, or the postmaster-general, or the East India Company, or bound to the Newfoundland fisheries or the coast of Labrador, are excepted from the operation of the act. There are also statutes concerning passengers who emigrate. Of these the last and most important is the 12 & 13 Vict. c. 33, 'for regulating the Carriage of Passengers in

Merchant Vessels.' This act embodies and amends all the previous regulations, and appoints emigration officers for the inspection of passenger-ships, who are to see that there is fit accommodation, sufficiency of food, water, &c. The 4 Geo. IV. c. 88, regulates the carriage of passengers between Great Britain and Ireland. If a passenger fails to pay his fare, the master or owners have a lien on his luggage for the amount. At the commencement of the voyage the ship must be sea-worthy, tight, staunch, and sufficient, and properly equipped with all necessary tackle. The ship must be also provided with a master and crew competent to command and work her, and also with a pilot when necessary, either from circumstances or from the law of the country. The master must procure and keep all documents, papers, clearances, &c., required by the authorities in respect of the ship and cargo; and he must abstain from taking or keeping on board contraband goods or false papers. He must pay the charges and duties to which the ship is subject. The statutes 3 and 4 Wm. IV. c. 52, and 1 and 2 Vict. c. 113, contain the enactments relative to what is necessary to be done in respect of the custom-house regulations by ships carrying goods from the United Kingdom beyond seas. If the ship during the voyage is so damaged that she is unable to proceed without repairs, the master may detain the cargo, if not of a perishable character, till the repairs are made. If the cargo is of a perishable kind, he ought to transship or sell it, as may appear the most beneficial course. He may also, in all cases where the circumstances require it, exercise a discretion as to transshipping the cargo; as, for instance, when the ship is wrecked or in imminent danger.

Hypothecation of a cargo, like hypothecation of a ship, is 'a pledge without immediate change of possession.' The party to whom the goods are hypothecated immediately acquires a right to have possession of them if the money advanced is not paid at the time agreed on. This power of the master under circumstances of urgent necessity to sell or hypothecate the goods must be exercised with great circumspection; and the exercise of it can only be justified when it is consistent with what would have been the conduct of a discreet and able man under the circumstances. During the voyage the master is bound to take every possible care of the cargo, and to do all things necessary for its preservation, and he and the owners will be answerable for all damage which might have been avoided by the exercise of skill, attention, and forethought. Upon payment of freight and the production of bills of lading, the cargo must be delivered to the parties entitled to receive it. If goods are sold by the custom-house officers before the freight is paid, the master is entitled to receive the first proceeds of the sale in discharge of the freight.

Certain circumstances operate as an excuse to the master and owners for non-fulfilment of their contract for the safe carriage of goods in the ship; such as lightning, tempest, and other casualties. But if a ship is placed in a dangerous situation by the carelessness or unskilfulness of the master, and is consequently lost, there is no legal excuse. By the 26 Geo. III. c. 86, owners are relieved from losses proceeding from fire, and also from the robbery, theft, and embezzlement of 'gold, silver, diamonds, watches, jewels, or precious stones,' unless at the time of shipping them their quality and value are made known in writing to the master or owners. The first statute which was passed as to the responsibility of owners in the case of any loss to the shippers was 7 Geo. II. c. 15, which was followed by the 26 Geo. III. c. 86; and the 53 Geo. III. c. 159, supplied some deficiencies in the former statute, limiting the responsibility still further than the first statute had done. The last statute applies only to registered ships, and as to them may be considered as containing almost all the law upon the subject. By this act the responsibility is limited to the value of the ship and freight. In cases where ships receive injury from collision with each other, the maritime law, which is acted on in the Court of Admiralty, differs in one respect from the law of England. If the collision has occurred without any fault on either side, as, for instance, from a tempest, each party must bear the injury which he has sustained. If it happens wholly from the fault of one ship only, her owners are liable, as far as the value of the ship and freight, to which, by 53 Geo. III. c. 159, their liability is limited, for the amount of injury caused by their own conduct. Thus far the laws are in accordance with each other. If the collision has been caused by the faults of both ships, then, according to the law of England, each party must sustain his own loss. But by the maritime law the loss occasioned is, after computation, divided equally, and the owners of each ship sustain half.

When an agreement for conveyance is expressed in the general form, or when there is no actual agreement, but only one implied by law from the circumstances of the case, there results from it a duty upon the masters and owners, firstly, to deliver the goods at the place of destination, whether the ship is hired by the voyage or by the month. It is only by the entire performance of this duty that they can entitle themselves to the payment of freight. The parties may, however, so express the contract that the payment of all or part of the freight may be made before or during the course of the voyage. In such case the word freight is perhaps used in a sense which does not properly belong to it; for, strictly speaking, it means only money accruing for the conveyance of goods in consequence of their delivery at the place of their destination.

Salvage is that reasonable compensation which persons are entitled to receive who save a ship or cargo from loss or peril by sea, which may be called civil salvage; or recover them after capture, which may be called hostile salvage. There is no fixed amount of salvage. What is reasonable can only be determined by a reference to the circumstances.

Unless in cases where the services have been trifling, the salvage is generally not less than a third and not more than one-half of the property saved. If the parties cannot agree as to the amount, the salvors may retain the property until

compensation is made; or they may bring an action, or commence a suit in the Admiralty Court, against the proprietors for the amount. The Court of Admiralty has jurisdiction in those cases only where the salvage has been effected at sea, or within high and low-water mark. Several statutes have been passed providing for what is to be done in case of ships in distress, and for the purpose of regulating and facilitating the adjustment of demands of salvage. The 12 Anne, c. 18, s. 2, applies to cases where the assistance has been rendered by the persons mentioned in that act. The 26 Geo. II. c. 19, provides for the case of persons voluntarily rendering assistance. The 48 Geo. III. c. 130, and 1 & 2 Geo. IV. c. 76, are applicable to cases where assistance is given at the request of persons belonging to the ship. The statutes 53 Geo. III. c. 87, and 1 and 2 Geo. IV. c. 75, contain some enactments relative to the same subject. None of these acts apply to the Cinque-Ports. The statutes which relate to the Cinque-Ports are 49 Geo. III. c. 122, s. 14; 1 & 2 Geo. IV. c. 75, s. 13; and 1 & 2 Geo. IV. c. 76.

In the reign of George II. provision was for the first time made by various statutes for the restoration of a recaptured ship and cargo to the owners, and the rates of salvage were fixed, varying according to the length of time that had elapsed since the capture. In the reign of George III. these rates were done away with, and by various acts the rate of salvage was fixed at one-eighth of the value in the case of king's ships, and one-sixth for private ships; if the recapture was effected by the joint operation of king's and private ships, the Court of Admiralty were to order such salvage as was reasonable. Ships and merchandise taken from pirates are subject, by 6 Geo. IV. c. 49, to a payment of one-eighth of the value.

4. The 5 & 6 Wm. IV. c. 19 repealed all former acts which regulated the hiring of seamen; and the 5 & 6 Wm. IV. c. 19 has been repealed, with the exceptions above stated, by the 7 & 8 Vict. c. 112, which contains the present law relating to merchant-seamen and for keeping a register of them. This act contains sixty-four sections.

The seaman may recover his wages by suit, either in the common law courts or in the Admiralty Courts. If in the former, his only remedy is against his debtor personally; if in the latter, he may proceed also against the ship itself. The remedy of the master against the owners is confined to an action against them personally, in the ordinary law courts; but seamen may bring a suit, in which they all may join, in the Admiralty Court; and they can either arrest the ship, or proceed personally against the owners or the master. In the case of British seamen, if the contract be made by deed containing terms and conditions different from those resulting in contemplation of law from an ordinary service, the Court of Admiralty ceases to have jurisdiction.

Marine Insurance.—A maritime insurance is a contract by which one party, who is called the insurer, in consideration of a premium, undertakes to make good to another, who is called the insured or assured, the loss or damage which may befall his ship or goods on their passage from one place to another. The instrument containing such a contract is called a *Policy*. It is usually not under seal, unless the insurers are an incorporated company. A great proportion of the business connected with the shipping insurance of this country is transacted at Lloyd's underwriters' establishment in the Royal Exchange, London. Insurers are commonly called underwriters, from the circumstance of their writing at the foot of the policy their names and the portion they are severally willing to take of the amount for which the merchant desires to insure.

The form of policy usually adopted is of ancient origin, and rather obscure in its phraseology, but most of its terms have acquired a certain meaning from judicial interpretation, and it is therefore found convenient to retain them.

The ordinary form is found in treatises on the Law of Shipping.

The policy will be vitiated by misrepresentation or concealment, on the part of the assured, of any fact material to a correct estimate of the risk; and the underwriter will be discharged from liability if the ship do not proceed on the same voyage with that described, or if there be any unnecessary stopping or deviation.

On the subjects of AVERAGE and BARRATRY, see those articles.

(Park, 'On Marine Insurance;' M'Culloch's 'Commercial Dictionary,' art. Marine Insurance.)

The system of the Navigation Act, as it is termed, had its foundation during the Protectorate; but the act so called was the 12 Chas. II. c. 18. This act declared that no produce of Asia, Africa, or America should be imported into Great Britain except in British ships, navigated by a British subject, and having at least three-fourths of their crew composed of British seamen. It also laid higher duties on all goods imported from Europe than if they were imported in British ships. To this act many persons have attributed the great growth of British shipping. When the American colonies became independent, their ships lost the advantage which they had when the States were colonies, and their shipping was placed on the same footing as other foreign ships. The consequence was that American ships sailing to Great Britain came in ballast, while British ships carried merchandise both ways; and accordingly the United States placed British shipping under the same disadvantages in their ports that American shipping was under in British ports. The consequence of this was that British ships sailed to America in ballast when they went to the United States to get a cargo, and American ships came to Great Britain in ballast when they wanted a British cargo. The consumer of the foreign produce in both countries accordingly paid double freight for it. This lasted till 1815, when it was agreed by treaty between Great Britain and the United States that the ships of the respective countries should be placed on the same footing in the ports of Great Britain and the United States; and all the discriminating duties were mutually repealed.

In 1822, Mr. Wallace, president of the Board of Trade, introduced four bills, which made other important alterations. The 3 Geo. IV. c. 41 repealed certain statutes relating to foreign commerce, which were passed before the Navigation Act. The 3 Geo. IV. c. 42 repealed various laws that had been passed since the Navigation Act, and also that part of the Navigation Act which enacted that goods of the growth, produce, or manufacture of Asia, Africa, and America should only be imported in British ships, and that no goods of foreign growth, production, or manufacture should be brought into Great Britain from Europe in any foreign ship, except from the place of their production or from the ports from which they were usually brought, and in ships belonging to the country of production or accustomed shipment. The 3 Geo. IV. c. 43 permitted certain goods then enumerated to be brought to Great Britain from any port in Europe in ships belonging to the port of shipment. The 3 Geo. IV. c. 44 permitted the importation, subject to certain duties, into certain ports, of various articles from any foreign country in America or port in the West Indies, either in British vessels or in vessels belonging to the country or place of shipment, and such goods might be again imported to any other colony or the United Kingdom. The 3 Geo. IV. c. 45 permitted the exportation in British ships from any West India colony to any foreign port in Europe and Africa, of any goods that had been legally imported into the colony, or which were of its growth or manufacture; and it permitted the exportation of certain articles, enumerated in the act, in British ships to any such colony from any foreign port in Europe or Africa.

In 1823 Prussia retaliated, as the United States had done, which led Mr. Huskisson to propose the passing of what are called the Reciprocity Acts, 4 Geo. IV. c. 77, and 5 Geo. IV. c. 1, which empowered the king, by order in council, to authorise the importation and exportation of goods in foreign ships, from the United Kingdom, or from any other of his majesty's dominions, on the same terms as in British ships, provided it shall first be proved to his majesty and the privy council that the foreign country in whose favour such order shall be made shall have placed British ships in its ports on the same footing as its own ships. Since that time reciprocal treaties of navigation have been made with the following countries: Prussia, Denmark, Hanover, Oldenburg, Mecklenburg, Greece, Bremen, Hamburg, Lübeck, States of La Plata, Colombia, Holland, France, Sweden and Norway, Mexico, Brazil, Austria, Russia, and Portugal. That with the United States of North America, as already observed, dates from 1815.

An act was passed in 1849, entitled 'An act to amend the Laws in force for the Encouragement of British Shipping and Navigation' (12 and 13 Vict. c. 29). The full meaning of this act can only be understood by referring to the acts and parts of acts which it repeals, and to its provisions. It repeals a part of the 4 Geo. IV. c. 77, and the whole of the 5 Geo IV. cap. 1. The general purpose is to diminish the restraint on the freedom of navigation. British shipping has already derived great advantages from the enactments above mentioned, and the Reciprocity Acts.

Seamen in the Royal Navy, and Impressment.—It is stated by Blackstone, on the authority of Foster, 'that the practice of impressing and granting power to the Admiralty for that purpose is of very ancient date, and hath been uniformly continued by a series of precedents to the present time, whence he concludes it to be a part of the common law.' As impressment is effected by the king's commission, Barrington, in his 'Observations on Ancient Statutes,' p. 334, 5th ed., shows that the king used once to exercise the power of impressing men for the land service also, and even for his own private service, as in the case of goldsmiths. The legality of impressment is fully established, though the practice cannot be defended even on the ground of the safety of the state, until it has been shown that seamen for the royal navy cannot be procured by other means. The general rule is, that all seamen are liable to impressment. There are several legal decisions as to the question who are seamen, and who may be privileged.

Volunteer seamen are induced to enter the royal navy by higher wages; and every foreign seaman who shall have served in a ship of war, a merchant ship, or privateer, for two years during a war, is thereby naturalised. The 7 & 8 Vict. c. 112, s. 32, enacts that overseers of the poor, or other persons having the authority of overseers of the poor, may apprentice to the British merchant sea-service, with their consent, boys whose parents are chargeable to parishes, &c., or maintained by them, or who shall beg for alms therein.

The commerce of Great Britain gives regular employment to a vast body of seamen, and the habits and occupation of a large number of people on the sea-coast give them a relish and a capacity for sea service. With the great increase of the commercial navy of Great Britain, which has taken place of late years, and the prospect of still greater increase of commerce by the restrictions on trade being removed, we may always reckon on a sufficient number of seamen in the commercial navy to make up the deficiency in the royal navy in case of a sudden war. It is probable that many thousand men might be drawn from the commercial navy for the royal navy, on any emergency, by offering them better wages, and thus the necessity of impressment might be removed. The amount of inconvenience that may be sustained by the merchant service by the withdrawal of a great number of seamen at once, is the same, whether the seamen are impressed or go as volunteers; but to the inconvenience arising from the actual withdrawal of seamen by impressment must be added the loss and inconvenience to the merchant service from seamen keeping out of the way in order to avoid being impressed.

SHIRAZ. [PERSIA.]

SHIRE, from the Saxon *schyran*, to divide (whence also *to shear*), is the name of districts into which the whole of Great Britain and Ireland is divided. The word shire is in most cases

equivalent to *County*, a name often substituted for it in Great Britain, and always in Ireland. The origin of this distribution of the country cannot be ascertained. Sir Francis Palgrave shows the shires to be identical, in many cases, with Saxon states; thus Kent, Sussex, Essex, Norfolk, Suffolk, Middlesex, and Surrey, were ancient kingdoms: Lincolnshire, under the name of Lindesse, was an independent state, and Worcestershire (*Huiccas*) was the jurisdiction of the bishop of Worcester. Another class of shires were formed out of large divisions, either for the sake of more easy management when the population of the particular district had increased, or for the sake of giving territory to an earl. Yorkshire was part of the kingdom of Deira, and Derbyshire of Mercia. Lancashire was made a county subsequently to the Conquest. On the other hand, some shires have merged in others: Winchelcombeshire is a part of Gloucestershire; and in the act for abolishing the palatine jurisdiction of the bishop of Durham (6 and 7 Will. IV. c. 19, s. 1) no less than five shires are mentioned, viz. Craikshire, Bedlingtonshire, Norhamshire, Allertonshire, and Islandshire, which have long ceased to possess, if indeed they ever had, separate jurisdictions.

The uses of the division into shires may be learnt by an enumeration of the principal officers in each: 1, the lord lieutenant, to whom is entrusted its military array [Lord Lieutenant]; 2, the custos rotulorum, or keeper of the rolls or archives of the county [Custos Rotulorum], such as the county-court rolls—this officer is appointed by letters-patent under the great seal, and is now always identical with the lord-lieutenant, except in counties of cities, where the high steward is usually custos rotulorum; 3, the sheriff, or, as he is often called, the high sheriff [Sheriff]; 4, the receiver-general of taxes, who is appointed by the crown, and accounts to it for the taxes levied within his district; he also receives the county rates, and disburses them as the magistrates in quarter-sessions, or as any other competent authority, direct; 5, the coroner [Coroner]; 6, the justices of the peace, whose commission extends only to their own county, and who, assembled in sessions, have jurisdiction over many offences, and control over the county funds [Sessions]; 7, the under-sheriff, who is appointed by and performs nearly all the duties of sheriff; and 8, the clerk of the peace, an officer (almost always an attorney) appointed by the custos rotulorum, whose duty it is to file and produce recognisances, returning them, when forfeited, to the sheriff to be levied [Recognisance]: he likewise prepares or files indictments to be tried at the sessions or assizes, and in general acts as the officer of the justices in quarter-sessions. To this list of officers may be added the knights of the shire, or representatives of the county in parliament.

County rates are assessments made by the justices in quarter-sessions assembled, according to estimates laid before them. [County Rate.]

The judicial tribunals in each county are: the assize court [Assize]; the county court, presided over by the sheriff, and, until Magna Charta, a court of record; the hundred courts, courts leet, and the new county courts. [Courts Leet.]

The principal subdivision in a county is the hundred, a district which in its origin perhaps bore relation rather to the population than to any uniform geographical limits. In Yorkshire the sub-division is called a wapentake. Kent is divided into five lathes, which are subdivided into hundreds. The subdivision of the hundred was the tithing, composed, as it is alleged, of ten free families (the hundred, it is said, containing originally a hundred free families), and having for an officer the tithing man, a head constable.

There are three counties-palatine, the earl of which had within his shire all the fiscal and judicial powers of the crown:—Chester, created by William the Conqueror; the duchy of Lancaster, created by Edward III. (these two have been long annexed to the crown); and Durham, heretofore governed by the bishop, but annexed to the crown by statute in 1836. In the latter year, a part of the see of Ely, which had been a royal franchise, was annexed to the crown, as Hexhamshire in Northumberland had been in the reign of Elizabeth.

SHIRLEY. There were three brothers called *Shirley*, or *Sherley*, as the name was formerly spelled, all of whom were distinguished as travellers. They were sons of Thomas Shirley, a gentleman who resided in Sussex.

Thomas Shirley, the eldest son, was born in 1564. After completing his studies at Oxford, he seems to have lived with his father till the reputation acquired by his brothers induced him to travel also. He appears to have been knighted. He published his 'Travels in Turkey,' 4to., black letter. We are not acquainted with the time and place of his death.

Anthony Shirley was born in 1565. After having taken his bachelor's degree at Oxford, he served in the English army in Holland, and afterwards in the West Indies. In 1597 he was knighted by Queen Elizabeth, and sent on a mission to Ferrara; which being ended he resolved to travel into Persia, and left Venice for that purpose, March 24, 1598, accompanied by his brother Robert. Sir Anthony, after his arrival at Casbin, soon acquired the favour of Shah Abbas, by whom, in April, 1599, he was sent as plenipotentiary, accompanied by Hosseyn-Ali-Bey, to various courts of Europe, for the purpose of getting them to combine with the Shah in a war against the Turks. He died in Spain in 1630 or 1631. An account of his Voyage to the West Indies is given in Hakluyt's Collection, vol. iii., edition of 1600. His travels in Persia were published in a separate form, 'Relation of Sir Anthony Shirley's Travels in Persia, with his magnificent Entertainment in Persia,' Lond., 1632, 4to. His travels by Astrakhan through Russia are given in Purchas's 'Pilgrimages.'

Robert Shirley was born about 1570. When Sir Anthony Shirley left Persia on his mission, Robert remained in the service of Shah Abbas, and had a situation in the army. In 1604 the Shah granted him permission to return to England, and gave him various missions to perform. Shirley

did not reach England till 1612. Having had an audience with James I., and remained a short time in England, he returned to Persia; but in 1616 Shah Abbas sent him as ambassador to the different European powers, for the purpose of inducing them to make war on Turkey. He arrived in England in 1623. His letter of credit being written in Persian, no one was found able to read it. At length, in 1626, Nogdi-Ali-Beg arrived in England as ambassador from Persia, and at his audience with James I. affirmed that Shirley was an impostor, and the letter a forgery. Sir Dodmore Cotton was sent by James I. as ambassador to Shah Abbas, together with Nogdi-Ali-Beg, and Shirley. Nogdi-Ali-Beg died on the passage; but Shah Abbas himself, through his first minister, affirmed that the letters were forged. There is little doubt however that they were genuine, though thus disavowed. Shirley was now old, and these indignities seem to have hastened his death, which took place at Casbin, July 13, 1628. He appears to have been knighted, for Herbert calls him Sir Robert Sherley.

SHIRLEY, JAMES, was born in London, about 1594. He was educated first at the Merchant Tailor's School, London; next at St. John's College, Oxford; and lastly at Cambridge. Having taken holy orders, he obtained a curacy near St. Albans, but resigned it on becoming a Roman Catholic. He then opened a school at St. Albans, was unsucessful, came to London, and commenced his career as an author. The first work which he published was 'The Echo, or the Unfortunate Lovers,' a poem, London, 1618, 8vo. His first dramatic work was 'The Traitor,' a tragedy, London, 1625. He continued to write for the stage till about 1640, when he joined the royalists, and served under the earl of Newcastle.

During the Commonwealth and the Protectorate Shirley was again obliged to try the profession of a schoolmaster. After the Restoration he was a favourite dramatist. He does not appear to have published anything after 1659. He is the author of about 40 plays, in some of which he was assisted by George Chapman and others. The best edition of his 'Dramatic Works' is that by Gifford, London, 6 vols. 8vo. Besides plays and poems, he wrote 'Via ad Latinam Linguam' and 'Rudiments of Grammar.' He died Oct. 29, 1666.

SHIRVAN. [Georgia.]

SHOA. [Abyssinia.]

SHOEMAKER and SHOE TRADE. In the old statutes a shoemaker is called a Cordwainer, apparently a corruption of the French *Cordonnier*, which means a worker of Cordova leather. The companies of shoemakers in our ancient towns were incorporated under this name; and where some of these companies still exist, they still go by the same name. As a legal term, cordwainer is yet in use.

The trade, as now followed in London and other principal places, is subdivided into about twenty branches. The following may be set down as the chief: the Shoeman, or maker of the sole part of the shoe; the Bootman, or maker of the sole part of the boot; and the Boot-Closer, or joiner together of the leg, vamp, &c. The labour of these is especially directed to what is called the Men's Line; whilst others make the ladies' shoes or boots. There are many women too who get a livelihood by closing the shoe; while others again follow the various sorts of binding.

The mechanical processes, after marking and cutting out the leather, consist chiefly in various kinds of strong needlework, such as the lasting or tacking of the upper-leather to the in-sole, the sewing in of the welt, the stitching to this welt of the out or top sole, the building and sewing down of the heel, and the sewing or closing of boot-legs. The boot-closer is the most skilful of the persons employed, and receives the highest wages.

None of the common handicrafts is exercised by so large a number of persons as that of the shoemaker. The number of males 20 years of age and upwards returned under the census of 1831 as 'shoe and boot makers and menders' was 110,122 in England, 5819 in Wales, and 17,307 in Scotland; total, 133,248. There is a remarkable uniformity in all the English counties, Northamptonshire excepted, where the proportion is one to about 80. In the metropolis and in the above counties, women are extensively employed in the lighter parts of the business. The government contracts for the army and navy, the police, &c. are executed in London and at Northampton and Stafford; and the export market is almost entirely supplied from these quarters. The boots and shoes exported (chiefly to the East and West Indies and the colonies) are included in the general entry of 'leather wrought and unwrought,' in the parliamentary returns; but it is supposed that the value is almost a quarter of a million sterling annually. A large number of boots and shoes of the finer kinds are imported from France.

The boots and shoes imported into Great Britain in the year ending April 5, 1850, were as follows:—

	Pairs.	Duty.
Men's . . .	22,782	1193*l.*
Women's . . .	117,063	2316*l.*
Children's . . .	442	5*l.*
Boot Fronts . .	554,172	4778*l.*

The duty on boots and shoes varies from 3*s.* to 14*s.* per dozen pairs; on boot-fronts, from 1*s.* 9*d.* to 2*s.* 9*d.* per dozen pairs.

SHOOTING STARS. To what has been said on the subject of shooting stars under the head Meteoric Stones, it will be necessary to add, merely, that the opinion of their appearance, in extraordinary numbers, in the months of August and November, founded on the observations of MM. Humboldt and Bonpland in America, and of Professor Quetelet at Brussels, does not appear to be confirmed by more recent experiments.

With respect to the proposed method of finding the differences between the longitudes of terrestrial stations, by simultaneous observations of shooting stars, it may be observed that the impossibility, at present, of anticipating the nights in which the phenomena may be observed, and the small number of observations in which the

identity of a meteor is free from uncertainty, are serious obstacles to the general employment of the method. A few observations of such meteors do not afford a result on which much dependence can be placed; and a single observation appears to be liable to a risk of error amounting to several seconds of time in a computed difference of longitude.

SHO'REA, a small Indian genus of the natural family of *Dipterocarpeæ*. The genus is found as far south as the line; and *S. robusta*, the best known and most useful species, as far north as 30° N. lat., in many parts forming the forests which skirt the south-western base of the Himalayan Mountains. The family to which the *Shorea* belongs is remarkable for the number of useful products yielded by its different species, as the camphor of Sumatra, resin, oil, and valuable timber. *Shorea robusta* is the Saul Tree of the North-Western Provinces of Hindustan, where it is much used for house-timbers, gun-carriages, &c.

SHOREHAM. [Sussex.]

SHORTHAND. [Stenography.]

SHORTSIGHTEDNESS. [Sight.]

SHOT are the balls (generally solid) of iron which are discharged from guns, howitzers, or carronades. Solid shot vary in diameter from 1.955 inches, which is that of a one-pound ball, to 7.95 inches, which is the diameter of a 68-pound ball. For the naval service it has been proposed to discharge from howitzers hollow shot or unloaded shells, which, having greater diameters than solid shot with equal weights, are capable of producing more destructive effects against shipping.

SHOVEL, SIR CLOUDESLEY, was born in 1650, of poor parents. He was first noticed by Sir John Narborough, with whom he went to sea as a cabin-boy, but from his merit he soon rose to the rank of an officer. In 1675 he was appointed to the command of a ship, for his services in enabling Narborough to burn the ships of the Dey of Tripoli. On the accession of William he took the side of the new king, and distinguished himself in the battle of Bantry Bay, and obtained the honour of knighthood. In 1692 he was appointed rear-admiral of the red, and soon after greatly contributed to the victory of La Hogue. In 1694 he had the chief command in the expedition against Dunkirk; in 1704 he led the van in the battle of Malaga; in 1705 he had an active share in the capture of Barcelona; in 1707 he joined the Duke of Savoy in the siege of Toulon, after the raising of which he proceeded homewards with nine ships of the line, and was unfortunately wrecked off the Scilly Isles, Oct. 22, 1707.

SHOVELLER. [Ducks.]

SHREWSBURY. [Shropshire.]

SHRIKES, the English name of a family of Birds, commonly termed Butcher-Birds (*Laniadæ*, Vigors).

The family *Laniadæ* belongs to the dentirostral section of the Insessorial order, and, as in the allied family *Muscicapidæ*, the upper mandible is notched near its apex, and strong vibrissæ surround the base of the beak. The beak however is stronger in the *Laniadæ* than in the *Muscicapidæ*, and the general contour is more robust. The smaller species feed on insects, which they take in the same manner as the Flycatchers, but the more powerful species prey also upon birds, mice, and reptiles; in these the claws are sharp and fine, and assist as instruments of capture or prehension.

Mr. G. R. Gray makes the *Laniadæ* (his fifth family of the tribe *Dentirostres*) consist of but two subfamilies—the *Lanianæ* and the *Thamnophilinæ*.

Lanianæ.

Genera.—*Keroula*, J. E. Gray; *Corvinella*, Less.; *Laneus*, Linn.; *Collurio*, Briss.; *Eurocephalus*, Smith; *Oreoica*, Gold; *Falcunculus*, Vieill.; *Cyclarhis*, Sw.; *Laniellus*, Sw., *Telophorus*, Sw.; *Nilaus*, Sw.; *Napothera*, Müll.; *Prienops*, Vieill.; *Colluriocincla*, Vig. and Horsf.

Thamnophilinæ.

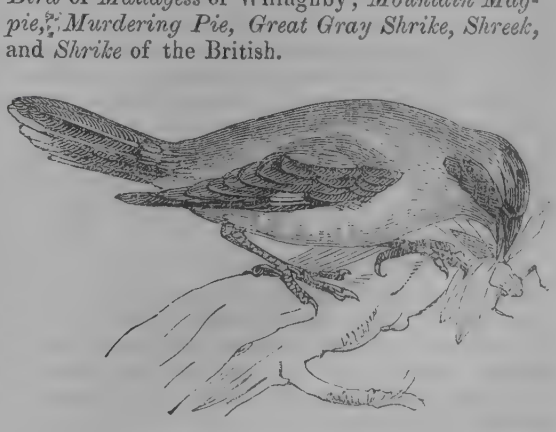
Genera.—*Thamnophilus*, Vieill.; *Cymbilaimus*, G. R. Gray; *Pityriasis*, Less.; *Vanga*, Buff.; *Laniarius*, Vieill.; *Dryoscopus*, Boie; *Chaunotus*, G. R. Gray; *Cracticus*, Vieill.

The *Dicrurinæ* are placed by Mr. G. R. Gray as the last subfamily (the 6th of the *Ampelidæ*); and the *Tyranninæ* occupy a position as the third subfamily in the family *Muscicapidæ*.

We proceed to illustrate this family with the genus *Lanius*.

Generic Character.—Bill very short, strongly hooked; the tooth very prominent. Wings moderate, somewhat pointed. Tail rounded or slightly graduated. Lateral toes free and equal. Claws acute.

We select as an example the Butcher Bird, *Lanius Excubitor*, Linn. This is the *Castrica Palombina* and *Averla Maggiore* of the Italians; the *Pie-Grièche Grise* and *Pie Grisatre* of the French; *Berg-Aelster*, *Grossere Neuntoder*, and *Gemeine Würger* of the Germans; *Greater Butcher-Bird* or *Mattagess* of Willughby; *Mountain Magpie*, *Murdering Pie*, *Great Gray Shrike*, *Shreek*, and *Shrike* of the British.



Butcher-Bird (*Lanius Excubitor*).

In England this species is only an occasional visitor, nor are we aware of any instance of its having bred here. 'The Gray Shrike,' says Mr. Yarrell, 'has been obtained in several southern and western counties; in Surrey, Sussex, Wiltshire, Dorsetshire, Devonshire, Worcestershire, and Cheshire; and I am informed by Mr. Thompson of Belfast, that it has occurred in one or two instances in the North of Ireland. A specimen

shot near Belfast is in the collection of Dr. J. D. Marshall. North of London, it has been killed in Suffolk, Cambridgeshire, Norfolk, Yorkshire, Cumberland, Northumberland, and Durham. No Shrikes appear to have been seen either in the islands of Orkney or Shetland; but the Gray Shrike is included among the birds of Denmark, Norway, Sweden, Lapland, Russia, and Germany. In Holland it is rare; but it is rather a common bird in France, and remains there throughout the year, frequenting woods in summer and open plains in winter. It is an inhabitant also of Spain, Portugal, and Italy.' ('British Birds.') The Prince of Canino notes it as common near Rome in winter. ('Specchio Comparativo.')

'This bird,' writes Willughby, 'in the north of England is called *Wierangle*, a name, it seems, common to us with the Germans, who (as Gesner witnesseth), about Strasburgh, Frankfort, and elsewhere call it *Werkangel* or *Warkangel*, perchance (saith he) as it were *Wurkangel*, which literally rendered signifies a *suffocating angel*. Our falconers call it the *Mattagess*, a name borrowed from the Savoyards, which is by Aldrovandus interpreted a *Murthering Pie*.' The food of this species, which haunts bushes, the skirts of woods and plantations, consists of mice, field-mice, frogs, small birds, lizards, and beetles. 'Although,' says Willughby, 'it doth most commonly feed upon insects, yet doth it often set upon and kill not only small birds, as finches, wrens, &c., but (which Turner affirms himself to have seen) even thrushes themselves: whence it is wont by our falconers to be reclaimed and made for to fly small birds.'

Mr. Yarrel states that the Gray Shrike feeds upon mice, shrews, small birds, frogs, lizards, and large insects.

The nest is generally built on trees, and is framed of grass-stalks, roots, and moss, with a lining of down or wool. The eggs, from four to six, or, according to Temminck, from five to seven, are bluish or grayish white, spotted on the larger end with light brown and ash.

SHRIMPS, *Salicoques* of the French, a very numerous family of Macrurous decapod crustaceans. Their body is generally compressed laterally, their abdomen is very large, and their tegument simply horny.

Family Character.—As in the Astacians, the base of the external antennæ is furnished above with a lamellar appendage; but, in the Shrimps, this lamella is much larger, nearly always entirely covered, and, generally, far surpasses the peduncle situated below. The feet are in general slender and very long, and the natatory false feet are encased at their base by lamellar prolongations of the dorsal segment of the corresponding wings of the abdomen, which descend very low. The caudal fin is large and well formed. The branchiæ are always composed of horizontal lamellæ, and are, in general, few in number.

M. Milne Edwards divides the family into four tribes:—

1. *Crangonians:*—Genera, *Crangon* (Common Shrimp), *Sabinea.*

2. *Alpheans:*—Genera, *Atya, Hymenocera, Alpheus, Pontonia, Autonomea, Caridina, Nika, Athanas.*

3. *Palemonians:*—Genera, *Gauthophyllum, Hippolyte, Rhynchocinetes, Pandulus, Lysmata, Palemon* (Prawn).

4. *Peneans:*—Genera, *Stenopus, Sicyonia, Penæus, Euphema, Ephyra, Oplophorus, Pasiphæa, Sergestes, Acetes.*

SHROPSHIRE, or SALOP, a county of England, lies between 52° 20′ and 53° 4′ N. lat. and 2° 17′ and 3° 14′ W. long. It is bounded N. by Cheshire and a detached part of Flintshire; E. by Staffordshire; S.E., S., and S.W. by the counties of Worcester, Hereford, and Radnor; and W. and N.W. by Montgomeryshire and Denbighshire. The greatest length N. to S. is 46 miles, and the greatest breadth 37 miles. A detached portion of the county, of considerable extent, is situated within the counties of Stafford and Worcester. The area is 1343 square miles. The population in 1841 was 239,048.

Surface and Rivers.—Shropshire contains every variety of surface, from the rugged mountain to the fertile and cultivated valley. The river Severn separates the county into two nearly equal divisions, and forms a boundary between the more elevated districts of the west and south, and an extensive level on the north and north-east, which extends into Cheshire and Staffordshire. On the west, various chains of Welsh mountains extend into Shropshire. The Breidden Hills, remarkable for their picturesque forms, are situated on the southern bank of the Severn, near where that river enters Shropshire. Corndon Mountain, one of the highest in Shropshire, is 1700 feet above the level of the sea. The hill called the Wrekin, near Wellington, rises 1320 feet above the sea, and being nearly detached from all neighbouring hills, as well as considerably higher, it forms a conspicuous object. The singular ridge called Wenlock-Edge extends from the valley of the Onny to the Severn at Coalbrook-Dale, a distance of about 20 miles. Wenlock-Edge is flanked on the east by a number of detached rounded hills, extending from the Onny to the town of Wenlock, all of which are under 1000 feet in height, and, as well as the greater portion of Wenlock-Edge, are under cultivation or planted to their summits. The Brown Clee Hills attain their greatest elevation in this county, in two hills called Abdon Barf and Clee Barf, the former of which is 1806 feet above the sea, and the latter 1600 feet. A few miles south of the Brown Clee Hills, and connected with them by a tract of sandstone, are the Titterstone Clee Hills, the summit of which attains the height of 1730 feet, and presents an extremely picturesque appearance in the scenery of this and adjoining counties.

Although Shropshire may be considered a well-cultivated county, yet there are extensive tracts of waste land, many portions of which might be enclosed with advantage. Some indeed of the elevated districts are too barren or rugged to admit of cultivation, but they afford herbage for sheep. Clun Forest is not a wooded tract, but consists of smooth rounded hills, which were formerly used as sheepwalks, and comprise up-

wards of 12,000 acres; but the greater portion of it is now enclosed. There are numerous wastes between Shrewsbury and Drayton, and the county also contains several extensive mosses or bogs, such as Bagley Moors, between Shrewsbury and Ellesmere, which would require an efficient system of draining, the expense of which, where drainage is practicable, would be more than compensated for by the improved quality of the soil.

The Forest of Wyre, on the right bank of the Severn, between Bewdley and Cleobury Mortimer, is a large tract, principally of underwood, which is cut down when young for the purpose of burning into charcoal to supply the iron-works in the vicinity. Shropshire contains a large quantity of oak timber.

The principal river of Shropshire is the Severn. [Severn and Wye.] The Teme has neither its rise, termination, nor the principal part of its course within Shropshire, yet, being the river next in size to the Severn, and connected with the drainage of the southern portion of the county, is next in importance to the Severn. It rises in Radnorshire, and soon forms the boundary between that county and Shropshire. It afterwards becomes the boundary between Herefordshire and Shropshire, and subsequently enters the latter a short distance above the town of Ludlow. It then alternately divides this county from Worcestershire and Herefordshire, and finally quits Shropshire and enters Worcestershire below the town of Tenbury, and falls into the Severn near Worcester. Its direction is nearly E., deflecting below Ludlow to the S.E. The Clun is a tributary of the last-mentioned river, and rises within the county in the wild uncultivated district called Clun Forest, and flowing E. falls into the Teme in Herefordshire. The Onny is also a tributary of the Teme. It rises among the Corndon Hills, and taking a S.E. direction, unites with the Teme about two miles above Ludlow. The Tern rises in the N.E. district of Shropshire, and flows S.W. by Market-Drayton. It then takes a course more directly S., and afterwards W., falling into the Severn between Atcham and Wroxeter. Its whole course is about 30 miles, and it is the longest of the Shropshire streams. The other rivers of Shropshire are the Roden, the Perry, the Meole Brook, the Cound, and the Warf, most of which are tributaries of the Severn. The prevailing tendency of the rivers is to the S. and S.E. The Severn is the only navigable river. The fish that frequent that part of the Severn which is in Shropshire are salmon, trout, grayling, pike, perch, shad, chub, gudgeon, and carp. The fish of the other rivers and streams are principally trout and grayling.

The lakes, or natural pools of water, are not numerous or extensive. The largest is Ellesmere, near the town of that name. It covers about 116 acres.

The *Canals* of Shropshire are confined to that portion of the county which lies north of the Severn. The Donnington Canal, Shropshire Canal, and Shrewsbury Canal are all connected. The Shrewsbury Canal is 17 miles in length. The Birmingham and Liverpool Canal is connected with the Shrewsbury Canal by a branch. The Chester and Ellesmere Canal traverses the northern part of the county. The southern part of Shropshire is wholly devoid of water communication.

A railway extends from Birmingham, through Wellington, Shrewsbury, and Oswestry, to Chester.

Geology.—It has been mentioned that the part of the county lying N. and E. of the Severn is more even and less elevated than the districts S. and W. of the Severn. This marked difference is intimately connected with the geological phenomena of the county; for the river Severn nearly forms the division between the new red-sandstone system on the north, and the older formations on the south.

The new red-sandstone system occupies the whole northern portion of the county, extending N. and E. into Cheshire and Staffordshire, and on the W. passing into the coal-formation of Chirk and Oswestry. On the S.W. it wraps round the edges of the Silurian rocks of Montgomeryshire, and extends for some miles S. of the Severn to the coal-formations about Westbury and Pontesbury, where the southern edge of the new red-sandstone overlies that coal-field which extends N.E. to near Shrewsbury; but the sandstone again penetrates S. to a narrow point near the Caradoc Hills, and is succeeded on the W. by the coal-field of Le Botwood. The edges of the rocks of the Silurian system extending N. across the Severn, as well as the trap-rocks of the Wrekin, again deflect the sandstone, the boundary-line of which is extended still farther to the N.E., from Wellington to near Newport, by the coal-formation of Coalbrook-Dale, on the western edge of which field the sandstone again appears, and occupies the remainder of the county lying E. of the Severn. The new red system in this part of England consists of saliferous marls, &c.; red-sandstone and quartzose conglomerate; calcareous conglomerate; and lower red-sandstone.

As the new red-sandstone system occurs in Shropshire in the form of a basin, it follows that the lower members will appear towards the edges of that system; and accordingly the lower red-sandstone is met with along the line which forms the boundary of the system. The town of Bridgnorth is built upon these lower beds. Bands of impure, concretionary, and mottled limestone occur in these beds, and bear a close resemblance to the cornstone of the old red-sandstone.

The coal-field of Coalbrook-Dale is the most extensive and most productive part of the carboniferous system of this county. It extends from near Wenlock, on the right bank of the Severn, across that river to Wellington on the N.W., and is prolongated in a N.E. direction to Lilleshall. The most productive portion of this field includes Broseley on the S., and stretches N. of the Severn in a large triangular-shaped mass, having Lilleshall for its apex. On the N.W. and E., being more than two-thirds of its circumference, this coal-field is bounded and overlaid by the lower new red-sandstone. On the W. it is flanked by a thin zone of the lower Silurian rocks, and by the trap-rocks of the Wrekin and Ercall Hills, and on the S. by the old red-sandstone and

upper Silurian rocks. In several places the seams of coal are numerous and of considerable thickness. At Hadley the number of seams is 16, and the total thickness of coal 15 yards; at Madeley, the seams are 24, and the thickness of coal 10½ yards.

The ironstone of this field is both concretionary and flat-bedded, and the various courses of it are known under various local names. The ores of iron are peroxides in sandstone, argillaceous carbonates in shale, and sulphurets in the coal. The sulphuret of iron is the most abundant mineral, and next to it the sulphuret of zinc, or blende. Petroleum occurs in great abundance in both the upper and lower measures, and some of the beds of shale of the latter afford excellent fire-clay, which is used in the manufacture of pipes and pottery.

The Shrewsbury coal-field extends from the Severn at the Breidden Hills on the W., to Shrewsbury on the E., and occupies a semicircular bay, of which Pontesbury is the southern point. The strata of this coal-field belong to the upper or youngest series of coal-measures. It varies in thickness from three to eight feet.

The coal-field of Oswestry is situated on the western verge of the county, and is quite distinct. The productive portion of it is very limited, occupying a small area between the town of Oswestry and the hills of Llanvorda, Trefonen, Treflach, and Sweeny. It contains only two seams of coal worthy of extraction, the upper being four feet thick; the lower, which is six feet thick, is a very inferior coal.

The other coal-fields of Shropshire are situated on the south side of the county. That of the Titterstone Clee Hill lies between the towns of Ludlow and Cleobury-Mortimer. The coal-field of the Brown Clee Hills lies a few miles north of the formation just mentioned, and, like that, is surrounded on all sides by the old red-sandstone, which here separates the coal-measures into two distinct elevations, known as the Clee Barf and the Abdon Barf. These two carboniferous tracts are the loftiest in Great Britain. In this coal-field, as at the Titterstone Clee Hill, there is abundant evidence of the tract having been heaved up into its present position by powerful forces acting from beneath, which have thrown the carbonaceous masses into separate troughs or basins.

The coal-field of Wyre or Bewdley Forest lies E. of those just mentioned, occupies the S.E. corner of the county, and extends into Worcestershire, the greater part of it lying within that county.

The old red-sandstone system occupies a considerable part of the southern division of the county. Another portion of the county, comprising about one-fourth of its surface, is composed of the stratified rocks of the Silurian and Cambrian systems. These occupy the southern division of the county lying west of a line drawn from Ludlow to the Severn at Coalbrook-Dale.

The Ludlow Rocks rise from the old red-sandstone of Corve-Dale into eminences of 1000 or 1100 feet above the sea, exhibiting the subdivisions of the formation, viz. the Upper Ludlow Rock, Aymestry Limestone, and Lower Ludlow Rock. West of these, and separated by Hope-Dale, is that unbroken escarpment extending from the valley of the Onny to Coalbrook-Dale, called Wenlock-Edge, and composed of Wenlock Limestone. This is succeeded by Wenlock-Shale, composing the valley east of the Caradoc Hills, which consist chiefly of different varieties of amorphous trap, flanked on the east and west sides by the Caradoc Sandstone. The Ludlow Rocks extend into Montgomeryshire, and this formation occupies nearly the whole of Shropshire lying S. and W. of the Onny.

The trap-rocks of the Wrekin, &c., as in the other volcanic districts, have disturbed and altered the adjacent strata; and from observing these phenomena, and the dislocations of Coalbrook-Dale and the Clee Hills, 'it may,' says Mr. Murchison, 'be affirmed that this district in Shropshire furnishes proofs of the alternate play and repose of volcanic action during very long periods.'

Soil and Agriculture.—The soil of the county on the right bank of the Severn is chiefly a red clay and gravel, derived from and overlying the new red-sandstone formation; it is favourable for many kinds of agricultural produce. The south-west portion of the county is the least productive. The ground is too steep and elevated, and the soil too light to admit of general cultivation. The valleys consist of loam, resting on gravel, and forming good meadow and pasture land.

The farms in Shropshire are for the most part arable, but some are for grazing, for hay, for the dairy, and for rearing and feeding. The crops in general cultivation are wheat, barley, oats, peas, vetches, turnips, potatoes, and beans.

The meadows adjoining the Severn, and other rivers and streams, are rich, and are often overflowed, and the water lies on them, especially near the Severn, for a considerable time. The fertilising effects of these floods are very great, and of value to the farmer, when occurring, as they generally do, before the grass is in a forward state, or after it has been mown and removed. Sometimes however a flood occurs near the period of hay harvest, when the effects are most disastrous, the crops in that case being often wholly destroyed. To prevent this, recourse has been had, in the upper portion of the Severn, to embankments, and as the total exclusion of flood water would perhaps be a worse consequence than the evil prevented, where attention is paid to this point care is taken to place flood-gates, which are shut or opened according to the period of the year.

Mining and Manufactures.—The rich coal-formations of this county and the iron-stone associated with them give employment to several thousand persons. The greater portion of these are engaged in raising coal, ironstone, and lime, and in the manufacture of iron, and a few in the lead-mines on the western side of the county. Near Coalport china of every description and of exquisite workmanship is made; and at Caughley, in the neighbourhood of Broseley, there is another china-manufactory, which is chiefly confined to the blue and white, and blue, white, and gold sorts. At Coalport there is a manufactory of earthen-

ware, similar to the Etrurian or Wedgwood ware. There are flannel-manufactories at Shrewsbury, Oswestry, Church Stretton, and Worthen. Carpets are made at Bridgnorth. Gloves are made at Ludlow, but not in such quantities as formerly. There are mills for dyeing woollen cloth at Le Botwood, &c., and there are paper-mills at Ludlow, Bridgnorth, Cleobury-Mortimer, Drayton, &c.

Divisions and Towns.—Shropshire is divided into 16 hundreds. It is in the dioceses of Hereford, Lichfield, and St. Asaph. It is in the Oxford Circuit, and the assizes are held at Shrewsbury. For parliamentary purposes, the county is divided into North Shropshire and South Shropshire, each division returning two members. The parliamentary boroughs of Bridgnorth, Ludlow, Shrewsbury, and Wenlock return two members each: total 12 members.

The following are the chief towns, with the population of each in 1841 :—

Bishop's-Castle, a market town, is 19 miles S.S.W. from Shrewsbury. It derives its name from a castle belonging to the bishops of Hereford, which formerly stood there. The town stands on the declivity of a hill, near the river Clun, and is irregularly built. The houses are mostly of unhewn stone, with thatched roofs. It contains a town-hall, a handsome market-house, and a fine old gothic church. Population of the town, 1510.

Bridgnorth. [BRIDGNORTH.]

Broseley, a market town, is situated 13 miles S.E. from Shrewsbury, near the south bank of the Severn. The inhabitants are chiefly employed in the coal-mines and iron-mines of the neighbourhood. Population of the parish, 4829.

Cleobury-Mortimer, a market town, is situated on the little river Rea, 27 miles S.E. from Shrewsbury. The town consists mostly of one long street. Population of the parish, 1730.

Coalbrook-Dale, to which the market has been removed from Madeley, two miles distant, contains very extensive iron-works, and coals are also raised in considerable quantities. By means of the Severn and canals, the products of this great manufacturing district are exported and distributed. The population of the parish of Madeley, in which Coalbrook-Dale is situated, is 7386, but the manufacturing district extends to Lilleshall, &c.

Drayton-in-Hales, or *Market-Drayton,* is situated 19 miles N.N.E. from Shrewsbury, on the northern bank of the Teme, and near the Liverpool and Birmingham Canal, on the borders of Staffordshire. The market was formerly very large. The parish church is ancient, but its gothic architecture has been injured by repairs made in 1787. The two townships of Drayton Magna and Drayton Parva contain together a population of 3161.

Ellesmere, a market town, is 16 miles N.N.W. from Shrewsbury. The town is neat and clean, and is beautifully situated near a lake ('mere'). The church is large, with a central tower, and a very fine east window. Population of the township, 2326.

Hales-Owen is situated in that insulated part of the county which is surrounded by Staffordshire and Worcestershire, 37 miles S.E. from Shrewsbury. The town stands in a valley, and contains many good houses. The church is a fine building, with a beautiful spire. There was formerly an extensive abbey at Hales-Owen, of which there are now hardly any remains. Population of the township, 2056.

Ludlow, a parliamentary borough and municipal borough, is situated on the eastern bank of the Teme, 25 miles S. by E. from Shrewsbury. The streets are broad, well paved, and lighted with gas, and the houses in general well built. The town contains a parish church, a gaol, and a free grammar-school. The parliamentary borough returns two members, and is coincident with the municipal borough. Population, 5171.

Newport, 17 miles E. by S. from Shrewsbury, on the borders of Staffordshire, is a small market town. Population of the parish, 2497.

Oswestry, a market town and municipal borough, is 16 miles N.W. from Shrewsbury, or 21 miles by the Birmingham, Shrewsbury, and Chester Railway, from which there is a branch 3 miles in length to Oswestry. The town is well paved and lighted, and is increasing in extent. It contains a town-hall and a small gaol. The church, erected since 1616, is spacious, and surmounted by a small tower. The manufactures are principally coarse linens and woollens. Population of the town and liberties, 4566.

Shiffnal, a market town, is 17¼ miles E. by S. from Shrewsbury, by the Birmingham, Shrewsbury, and Chester Railway. The church is a large cruciform building, containing a fine altar and some monuments. Population of the parish, 5244.

Shrewsbury, a parliamentary borough, municipal borough, and the county town, is 146 miles from London by Railway through Birmingham, Wolverhampton, and Wellington. The town is situated chiefly on a peninsula formed by the river Severn. It was formerly wholly contained within this peninsula, but has gradually extended beyond the Severn on the east and west side, forming the suburbs of Abbey-Foregate and Cobham on the east, and of Frankwell on the west; and on the north extending beyond the isthmus or neck occupied by the remains of Shrewsbury Castle, forming the suburb of the Castle-Foregate. The streets are irregularly laid out and narrow, but have been improved of late years. The houses are of varied character; modern buildings, many of them handsome, being mixed with others of greater antiquity. There are two bridges over the Severn. The English bridge (built 1774), a handsome freestone structure of seven semicircular arches, connects the Abbey-Foregate with the town; and the Welsh bridge, a plain structure of five arches, connects Frankwell with it. There is another bridge at Cobham, over the Meole Brook, which joins the Severn above the English bridge. There are some remains of the Benedictine abbey founded by Roger Montgomery in 1083. The abbey church, a cruciform structure, was in great part demolished at the dissolution. The remains constitute the parish church of Holy Cross parish. St. Alkmond's Church has been rebuilt in modern times, with the exception of

the tower and spire (184 feet high), which belonged to the more ancient structure. St. Chad's has also been rebuilt. It is a Grecian structure, of circular form, with a tower 150 feet high. St. Julian's was rebuilt about the middle of the last century; but the tower, which is of Norman architecture, belonged to the old church. St. Mary's is an ancient, large, and fine cross church, of Norman and early English architecture. There are several chapels of ease and places of worship for dissenters. Among other buildings may be mentioned the town and shire hall, a spacious and handsome stone building; the town and county gaol and house of correction; the military depôt, a handsome brick building near the Abbey Foregate; the house of industry; the infirmary; the public subscription library; the theatre; and the assembly rooms. On the south-west side of the town is The Quarry, a handsome public walk planted with lime trees, and extending along the banks of the Severn.

The trade of the town is considerable, especially in Welsh cloths and flannel from the counties of Denbigh, Montgomery, and Merioneth; thread, linen-yarn, and canvass are manufactured; and there are iron-works at Cobham. The Severn is navigable for boats of 30 or 40 tons, and there is a canal to Wombridge, which opens a communication with the Staffordshire potteries. The parliamentary borough returns two members; population, 17,688. The municipal borough is divided into 5 wards, and is governed by 10 aldermen and 30 councillors: population, 18,207.

Stretton, commonly called Church Stretton, a market-town, is 14 miles S. by W. from Shrewsbury. The town lies in a narrow valley. It is a place of little importance. Population of the parish, 1604.

Wellington, a market-town, is 10¼ miles E. from Shrewsbury by the Chester, Shrewsbury, and Birmingham Railway. It is a neat place, with a handsome modern church. Population of the township, 6084.

Wem, a market-town, is 11 miles N. by E. from Shrewsbury, and is near the Chester, Shrewsbury, and Birmingham Railway. The town is pleasantly situated near the source of the river Roden. It consists principally of one large street, and has a handsome church. Population of the parish, 4119.

Wenlock, a parliamentary borough and municipal borough, is 12 miles S.E. from Shrewsbury. The town consists of two streets. The principal object of interest in the neigbourhood are the ruins of Wenlock Abbey, which are situated in a valley on the south side of the town. The municipal borough is divided into 3 wards, and is governed by 6 aldermen and 18 councillors: population 18,016. The parliamentary borough returns two members: population, 19,774.

Whitchurch, a market town, is 19 miles N. by E. from Shrewsbury. The town is situated on an acclivity, on the top of which stands the church, a handsome structure, erected in 1722. Population of the township, 3403.

History and Antiquities.—Previous to the Roman invasion, the district, of which this county is now a part, was inhabited by the Cornavii and the Ordovices, their territories being divided by the Severn. After the subjugation of Britain this county formed part of the Roman province of Flavia Cæsariensis. Under the Saxons it was included in the kingdom of Mercia. It was in consequence of the attacks of the Welsh princes, that Offa, king of Mercia, formed that dyke or rampart which still bears his name, extending from Flintshire on the north to the Bristol Channel on the south. William the Conqueror bestowed this district upon his relation, Roger de Montgomery; but it was long before the Welsh princes could be subdued. In order to resist their encroachments a great number of castles were built on the western side of the country. The most important of those existing in the reign of Henry III. were those of Bridgnorth, Shrewsbury, Ludlow, Ellesmere, Cause, and Oswestry. Of these, Bridgnorth and Shrewsbury were originally Saxon fortresses. The ruins of a great number of castles yet remain; among these the ruins of Ludlow Castle are perhaps the most perfect on the Welsh border. The ecclesiastical and religious establishments in this county amounted to about fifty. The remains of many of these are to be seen at the present day.

SHROVETIDE, or SHROVE-TUESDAY (from the Anglo-Saxon *scrifan*, to confess), signifies the time of confessing sins; for which purpose this day was anciently set apart by the church of Rome as a preparation for the austerities of Lent. This season was likewise called *Fasting-Tide*, *Fastens*, and *Fast-Mass*, by all of which titles it is yet designated in different parts of the north. In the Reformed Church the ancient practice of shriving or confessing at Shrovetide is discontinued.

After the people had made confession, they were permitted to indulge in festive amusements, although not allowed to partake of anything beyond the usual substitutes for flesh; hence arose the custom yet preserved of eating pancakes and fritters at Shrovetide.

SHRUB. All plants are divided into Herbs, Shrubs, and Trees. A shrub is a plant with a woody stem, which approaches the tree in its duration and consistence, but never attains the height of a tree, and is generally taller than the herb. It varies in height from about 4 to 12 feet. Linnæus attempted to distinguish trees from shrubs by the former having buds and the latter having none. But this distinction is of no avail, as plants like the willow, generally called shrubs, possess buds, whilst most trees in hot countries are without them.

In horticulture shrubs are too well known to need a definition. For practical purposes they are divided into the deciduous and evergreen kinds, and each of these kinds may be further divided according to their hardy or tender habits, their form, size, mode of growth, colour, &c.

SHUMLA, *Schumna*, a town of European Turkey, in the pashalic of Varna, is situated on the northern declivity of the Balkan, on the road from Constantinople to Bukharest, 50 miles W. from Varna, in about 43° 12′ N. lat., 26° 53′ E.

long., and has 30,000 inhabitants. It is surrounded by walls and defended by a citadel, and although upon the whole it is not well built, there are so many mosques and baths, that the appearance of the town is agreeable. The mausoleum of Djezaïr-il-Hassan Pasha is one of the greatest ornaments. The commerce is considerable; the silk and cloth manufactures are active; the cotton manufactories, of which there are a great number in this place, supply the neighbouring provinces with the produce of their industry; and the extensive copper and tin ware foundries and tan-yards enrich the town considerably. The inhabitants consist of Turks, Bulgarians, Greeks, Armenians, and Jews. Being situated at the spot where the roads from the chief fortresses of the Danube to Constantinople meet, Shumla is the key of the Balkan. It came into the possession of the Turks in 1472. The Russians unsuccessfully besieged it in 1774 and in 1810; but they took it in 1828 under General Wittgenstein.

SI. [Solmisation.]

SIALAGOGUES (from *σίαλον*, 'saliva,' and *ἀγωγός*, 'that which leads or brings'), agents which increase the flow of saliva and other fluids from the parotid and other glands in the vicinity of the mouth. They operate in different ways, and are distinguished into local or remote. Of the local, some are gaseous, others are solid; these last are also termed *Masticatories*. Of the gaseous, the most familiar is the odour of savoury food. By the motion of the jaw in the act of mastication a flow of saliva is occasioned, and this result occurs however insipid or insoluble the substance may be which is moved about in the mouth. Hence even a pebble will cause it. But if the substance possess an agreeable aroma, or a considerable degree of pungency or acrimony, a greatly-augmented secretion is the consequence. In hot climates piquant articles are extensively used to stimulate the languid action of the digestive organs. Remote sialagogues are first received into the system by the stomach or other channels, and then exert a peculiar influence on the salivary glands. Of these the most familiar is mercury.

SIAM. Including the countries tributary to or dependent on it, Siam extends from 4° to 22° N. lat., and from 98° to 105° 20′ E. long. It comprehends a vast extent of country in the peninsula beyond the Ganges, and the larger part of the Malay peninsula. On the east of Siam lies Cochin-China or Annam; on the north is China and Laos; on the west is the Birman Empire; and on the south are the independent states of the Malay peninsula, Perak and Pahang. The area is difficult to estimate, but is probably not less than 250,000 square miles.

A considerable portion of Siam is covered with mountains and hills. The mountainous and hilly part appears to be connected with two chains of mountains, running south and north into China. North of 22°, and without the boundaries of Siam, both ranges seem to approach so near to one another as to constitute one extensive mountain-region furrowed from north to south by the narrow valley of the river Menam, but after entering Siam the mountains gradually recede, and contain the wide valley of that river.

The mountains of Siam terminate near 11° N. lat., on the isthmus of Kraw. The high ground which traverses the isthmus of Kraw from north to south, which extends from 12° to 9° N. lat., can hardly be called hilly. It is also separated from both the mountain-ranges which lie north and south of it, the mountains of Siam and those of the Malay peninsula, by deep and wide depressions.

The coast is lined, at a distance of 10 to 20 miles, with a series of islands. The long channel between them and the mainland has depth enough for the largest vessels. The islands are rocky, and most of them high: some rise to more than 3000 feet. The channels between them are very deep, and usually free from danger. Most of these islands are only from two to six miles long. The largest, from north to south, are the following: St. Matthew's Island (10° N. lat.), also called Elephant Island, is about twelve miles long and six wide, and has at the north part an excellent harbour. Salanga, or Junk Seylon (8° N. lat.), is about sixteen miles long and six wide, and on its east side are some tolerably good harbours. Farther south, between 6° 49′ and 6° 8′, is the group of the Lancava Islands, which, in addition to several smaller ones, contains the islands of Trotto, Lancawi, and the two Laddas. They are also very elevated, and have some good harbours.

The eastern coast of Siam is much lower and wider than the western, the mountains being frequently 15 or 20 miles distant. In fertility it is also superior to the western coast: several extensive tracts yield rich crops of rice; and others, though uncultivated and covered with jungle, exhibit a vigorous vegetation. The islands along this coast are not numerous, nor elevated, except Tantalem, the largest, which however is not very high.

To the east of the mountains of Siam is the large valley of the river Menam, supposed to be about 360 miles long by 60 in average breadth; it is fertile, and studded with villages and towns. The mountain-range which divides the valley of the Menam from that of the river Maekhaun or Cambodia is almost entirely unknown. Between the towns of Chan-ti-bon and Tung-yai lies a plain, which extends from the shores of the Gulf of Siam far inland, the mountains in these parts receding so far from the shores as not to be visible from the sea; this plain is very fertile, yielding much produce, which is exported from Bangkok to China. That portion of the Siamese Empire which lies east of the mountains of Cambodia belongs to the basin of the river Maekhaun, or river of Cambodia.

The river Saluen, which forms the boundary between Siam and the Birman Empire for 150 miles, is noticed under Birma. But the most important river of Siam is the Menam. This river rises in the south-western districts of the Chinese province of Yunnan, with two branches. The western and longer one, called Nanting-ho, has its origin near 24° N. lat., and has a general

southward course until it joins (south of 22° N. lat.) the other branch, called Maepraen, which is considered by the Siamese to be the principal branch, though its course does not appear to be so long. The united river passes by the old and new capitals, Ayuthia and Bangkok, and enters the sea by two branches. The adjacent country is overflowed by the Menam from September to December. The whole course of the river is about 800 miles. Of the affluents of the Menam, the two best known are the Mekhlong and the Tachin. About 30 miles east from the eastern mouth of the Menam is that of the river Bang-pa-kung, which is of considerable size, and probably runs more than 300 miles. A large lake is said to exist in the parallel of Ayuthia, but a considerable distance from it to the west. Its name is Lachado, and a river called Talan carries off its waters to the Menam.

Siam is rich in natural productions. Rice is most extensively cultivated. On the alluvial soil of the Menam it generally yields forty fold. Maize, several leguminous plants, sweet potatoes, cocoa, and areca palms, are cultivated. Siam is noted for a great variety and abundance of fruit-trees, and their produce surpasses that of all other parts of India in flavour. Several plants are cultivated as articles of foreign trade. The most important is the sugar-cane, which indeed has been grown in Siam from time immemorial; but its culture for the foreign market has now become very large. Tobacco, cotton, and black pepper, are also exported. The forests, which cover nearly all the mountain-ranges of this country, yield several articles of trade; among which are cardamums, gamboge, aquila-wood, sapan-wood, gum trees, and a great variety of timber trees.

In Siam the elephant exists in the greatest perfection, and is much employed for riding and as a beast of burden. The ivory, hides, and bones are largely exported to China. Black cattle, wild cattle, and buffaloes are numerous. The horses of Siam are of a small kind, resembling our ponies. A small kind of goat is kept about the temples. Hogs are numerous, both in a domestic and in a wild state. The lard, prepared with great care, is exported to the European settlements in the neighbouring countries. Fowls in their wild state exist in the forests of Siam, and the common fowl is reared in the lower countries. Wild animals and fish are very abundant in Siam.

Gold is found in the mountains of the Malay peninsula, and at the southern extremity of those of Siam, and is worked in some places. Tin, iron, copper, lead, zinc, and antimony, are met with in many places. The only precious stones which are known to exist in Siam are the sapphire, the oriental ruby, and the oriental topaz. Salt is made in the low wooded and uninhabited country which extends between the mouths of the Menam along the sea.

The population of Siam is composed of different nations, part of whom are aborigines, and part immigrants from other countries. The first class of inhabitants consists of Siamese, Laos, Cambodians, and Malays, who have attained a certain though different degree of civilization, and of Kariang, Lowa, Kha, Chong, and Samang, who occupy some mountain-regions, and seem to be backward in civilization. The immigrant nations are Chinese, Mohammedans, Hindoos, Peguans, and Portuguese.

The Siamese, Laos, Cambodians, and Malays, seem to belong to the same race with the Birmans and inhabitants of Cochin-China. They are all members of the great Mongol family, and they are all shorter than the nations of the Caucasian race. They speak a peculiar language, of which that which is spoken in Laos is only a dialect. The sacred literature is written only in the Pali language, which, together with the worship of Buddha, was introduced into Siam and the adjacent countries in the fourth century of our æra. The Siamese have made considerable progress in the cultivation of the soil, and they have very extensive orchards; but their houses and the dress of the common people indicate that in other respects they have not advanced far in the arts of civilization. The inhabitants of Laos and Cambodia are very similar to the Siamese. There are several native tribes, some of whom are migratory, inhabiting the mountainous tracts of Laos and Cambodia. The Chinese are dispersed over the whole country. There are a few Hindoos, and a greater number of Mohammedans, who have immigrated from Hindustan. They preserve their religion and dress. The Mohammedans have nine mosques at Bangkok, but they are all very poor buildings. The amount of the whole population is not known. It has been variously estimated at from 3,000,000 to 6,000,000.

Siam is composed of countries which constitute the kingdom of Siam, and are immediately subject to the sovereign, and also of tributary countries, governed by their own princes, who are dependent on the King of Siam. The former consist of the kingdom of Siam, and of a portion of the kingdom of Cambodia. The tributary princes inhabit the countries north and south of the kingdom. On the north are the countries of the princes of Laos; and on the south the princes who govern a portion of the eastern coast of the Malay peninsula.

In Siam Proper, the chief towns are the ancient and modern capitals—Ayuthia and Bangkok. Ayuthia is a large town, built on an island formed by two arms of the river Menam. BANGKOK is described in a separate article. The town of Bang-pa-söe is near the mouth of the river Bang-pa-kung; it is a considerable place, and carries on an active commerce with Bangkok. Farther up on the banks of the same river is the town of Patriyu, which contains a considerable population, and is fortified. Chan-ti-bun is the capital of a province of the same name; it has 30,000 inhabitants, and exports the produce of the province, consisting of rice, pepper, gamboge, cardamums, and aquila-wood. South of Chan-ti-bun is the town of Tung-hay, near the mouth of a small river which falls into a broad arm of the sea. Pi-sa-luk is a considerable town, near 18° 30′ N. lat. There are several other towns, of which little is known.

Samui, an island in the Gulf of Siam, is near 10° N. lat. It is not large, but fertile and a place

of trade, being visited annually by some Chinese junks, which export cotton and birds' nests. The group of the Sichang Islands lies within the more narrow portion of the Gulf of Siam. They are eight in number, and the largest, properly called Sichang, is five miles in length, and about a mile and a quarter in its broadest part. Between this island and Kohkam, the next in magnitude, is an excellent harbour. That portion of the kingdom of Siam which formerly belonged to the kingdom of Cambodia lies on the west of the great river Maekhaun, and is called Bangtang.

The Siamese do not distinguish themselves in any of the useful arts, and are much behind the Hindoos and Chinese. Even their vessels and trinkets of gold and silver are imported from China. Considerable manufactures are carried on; but they are mostly in the hands of Chinese who have settled in Siam.

Siam in a commercial point of view is considered the most important of the three empires which divide among them the countries between the Gulf of Bengal and China. As all the provinces of the empire produce some articles which are in demand in foreign countries, and nearly all the foreign commerce is at present concentrated in the town of Bangkok, the inland and coasting trade is very considerable. Large quantities of produce are brought down to Bangkok from the inland districts, by the rivers, especially the Menam. The most important branch of the foreign trade is that with China. It is partly carried on by Chinese vessels, but mostly in vessels built in Siam and navigated by Chinese. Very little if any commercial intercourse exists between Siam and the Birman Empire. With Cochin-China there is much commerce. The most important trade, next to that with China, is with the European establishments on the Malay peninsula, and the Sunda Islands, especially with the British colonies of Singapore, Malacca, and Pulo Penang, and with the Dutch establishments of Batavia, Cheribon, and Samarang in Java, Pontianac in Borneo, and Rhio in Bintang. Formerly the commodities of Hindustan and Europe reached the capital of Siam by being transported across the isthmus of Kraw and the Malay peninsula; but at the present day Singapore is a better emporium for procuring the goods, and the conveyance by this route is less expensive.

The early history of Siam is entirely unknown. In 1511 the Portuguese, after the conquest of Malacca by Albuquerque, established an intercourse with Siam. In the 16th century Siam was for many years subject to the Birmans, but recovered its independence towards the close of that century. In 1612 the first English vessel went to Ayuthia. Towards the end of the same century, commercial relations were established between Siam and the French, but were not of long continuance. In the early part of the 18th century a civil war desolated the country, and in this state of things the Birman sovereign Alompra meditated the conquest of Siam. He was prevented from the execution of this design by his death (1760), but one of his successors prosecuted his plan, and after laying waste the country, the Birmans took the then capital, Ayuthia. The King of Siam had been killed in the assault, and his family was carried away to Ava as prisoners. Soon afterwards the Birman army left the country, and a chief of Chinese descent seized upon the throne and proclaimed himself king; but he was put down in 1782, since which date neither Chinese nor Birmans have had power over Siam.

The government of Siam is despotic, not even limited by ancient customs, by the established tenets of religion, or by the authority of hereditary chiefs. No heir to the throne is appointed during the life-time of the king; for to imagine his death is considered high treason. Consequently, at the demise of a king the throne is generally disputed by any persons who think themselves entitled to it, and on such an occasion civil wars can rarely be avoided.

SIAMANG. [APE.]

SIBBALDIA, a genus of plants belonging to the natural order *Rosaceæ*. *S. procumbens* is found on dry mountains in Scotland, in Europe, Siberia, and North America. *S. parviflora* is a native of Cappadocia.

SIBERIA is the name of that part of the Russian Empire which is in Asia, and extends from the Ural Mountains, which divide Europe from Asia, eastward to the seas of Okhotzk and Kamtchatka, both of which are parts of the Pacific Ocean. It lies between 45° 30′ and 77° 40′ N. lat., and between 60° and 190° E. long. The greatest length E. to W. exceeds 3600 miles; the greatest width N. to S. is hardly less than 1950 miles. Siberia is bounded on the E. by the Pacific, on the N. by the Polar Sea, on the W. by the Ural Mountains, and on the S. by the Chinese Empire and the steppes of the Khirghis Cossacks.

Surface.—This immense country, which probably exceeds Europe in extent by 1,000,000 square miles, offers less variety of surface than perhaps any other portion of the globe of equal extent. The western half of it, or that which lies W. of the meridian of the North-East Cape (105° E. long.), is almost one uninterrupted plain. The eastern half, or that which lies E. of 105° E. long., contains numerous mountain-ranges and hills, which occupy a great extent of country, between which some plains are inclosed. The mountains in some places rise above the snow-line. The plains are at different elevations above the sea; the southern being perhaps 2000 feet above the sea-level, whilst the most northern are so low that a part of them is inundated during hard gales. The surface may be best described in three sections—Western, Central, and Eastern Siberia.

Western Siberia lies between the Ural Mountains (60° E. long.) and 85° E. long., and the surface consists chiefly of one extensive plain. It may be divided into five regions, the steppe, the agricultural district, the mining district, the wooded region, and the northern plain or tundra. The *Steppe* comprehends the southern part of the plain as far north as 55° N. lat., and extends from the base of the Ural Mountains to the banks of the Irtish. Along its south-eastern border lies a wide hilly tract, consisting of ranges of hills with

rather barren intervening shallow valleys; but the rest of the steppe consists of a plain, covered with an immense number of small lakes, filled with brackish water, and separated by sterile tracts of land: it is called the Steppe of Ishim. The *Agricultural District* extends N. of the steppe, between the Ishim line of fortifications on the S. and 60° N. lat.; between the rivers Irtish and Oby it advances as far S. as 61° N. lat. This region presents a great diversity of soil and productions: covered with forests on the skirts of the Ural; fertile in the valleys of the rivers flowing from those mountains; rich in copper ore between the Tobol and the Irtish; swampy and brackish in the Steppe of Barabinza, between the Irtish and the Oby; and moderately fertile in a few isolated spots. The *Mining District* extends over the south-eastern part of Western Siberia, and comprehends the most western portion of the Altai Mountains. [Altai Mountains.] The *Wooded Region* lies north of 60°, but, properly speaking, the northern portion of the Steppe of Barabinza, as far south as 57°, ought to be included in it, as the general features are similar. The whole region is covered with species of pine and fir, and the birch is also common. No part of it is adapted to agriculture, though a few vegetables are grown. Fur-bearing animals are plentiful, and fish are abundant in the Oby. The *Northern Plain* is a low region, called the Tundra. The surface is nearly a dead level, and quite destitute of trees. Only a few shrubs occur, and the soil yields little else than moss.

Central Siberia lies between 85° and 105° E. long., and comprehends the greater part of the Altai Mountains, the hilly country east of the Oby, as far north as its affluent the Ket, the vale of the Upper Yeneseï, the plain of the Lower Angara River, the wooded plain, and the Tundra, in all six regions. The *Hilly Country*, between the Altai and the east bank of the Oby, is studded with hills near the Altai; but farther north it expands into an open plain, covered with coniferous trees. East of the river Tom the country is a table-land, furrowed by numerous rivers, along the course of which there are many wide bottoms considerably depressed below the surface of the plain, and having a fertile soil. The *Vale of the Yeneseï* is considered the warmest part of Siberia; and it is perhaps also the most fertile. It is inclosed by mountain-ridges, which sometimes rise above the snow-line. The vale extends about 350 miles from south to north, and nearly 200 from east to west, but perhaps not less than one-half of it is occupied by high mountains. The Yeneseï flows through a wide bottom covered with alluvium from two to three feet thick, of great fertility; and there is abundant herbage for cattle. The *Plain of the Lower Angara*, the most eastern part of the southern portion of Central Siberia, is an inclined plain which sinks towards the north, and in that direction is traversed by several rivers which run to the Lower Angara and Upper Toonguska. The surface of the plain is generally hilly, and the greater part is still covered with forests of larch, fir, and birch, and at intervals there are fields which produce moderate crops. The narrow valleys are inhabited by some small wandering tribes, who keep no domestic animals except camels, and this seems to be the most northern point of Siberia in which these animals are found. The whole plain is dry and extremely cold. The *Wooded Region* and the *Northern Plain*, or *Tundra*, are similar to the districts of the same names in Western Siberia.

Eastern Siberia, or that part of it which lies east of 105° E. long., comprehends about one-half of the whole surface of the country. It contains a much smaller portion of land fit for agricultural purposes than the other divisions, which is partly owing to the severity of the climate, and partly to the greater elevation of its surface in those parts which are south of 60° N. lat. From near the Sea of Okhotzk to Lake Baïkal, the general level of this region is 2500 to 3000 feet above the sea-level; it is a succession of plains, separated from one another by depressions, or by ridges of hills. The whole region is entirely unfit for cultivation, and it does not appear that any considerable portion of it is adapted for pasture: the climate is severely cold. The region around Lake Baïkal is described elsewhere [Baïkal]. The mountain-range which constitutes the southern edge of the table-land separates the streams which run northward to the river Lena from those which flow southward to the river Amur, and constitutes the boundary-line between Siberia and the Chinese Empire as far west as 119° E. long. The basin of the river Selenga, which runs north and south, contains a considerable number of tracts suitable for agriculture. That portion of Siberia which lies east of the basin of the Selenga, and is drained by the river Shilka and its two principal branches, the Ingoda and Onon, is called Da-Uria, which is said to signify 'boundary-country,' or 'border.' With the exception of a comparatively small tract along the south-eastern border, it is a mountain-region, traversed by several ridges running south-west and north-east, but nowhere rising to a great elevation. These mountains are rich in metallic ores, the hills yield a good supply of herbage, and the valleys of the rivers are moderately fertile. The Upper Vale of the river Lena is among the agricultural districts of Siberia, corn being grown as far north as the town of Yakutsk, and the herds of cattle being very numerous. The whole country east of the middle course of the river Aldan, between 59° and 60°, is a mountain-tract, extending more than 200 miles east and west to the vicinity of the Pacific. At the northern extremity of the Aldan Mountains (62° N. lat., and 141° E. long.) is a mountain-knot from which two chains branch off; one of these subdivides into two, which extend to Kamtchatka and to the shores of Behring's Strait; the other extends to the banks of the Lena. The country between the Lena and the Kolyma is traversed from south to north by several chains of hills; between which are many lakes which are dry at certain seasons of the year, and numerous swamps. Along the Polar Sea, and some distance from it, the country is a tundra, or low plain covered with moss; but the country east of the Kolyma is marked by mountains and bold rocky bluffs. The

country of the Tshooktshes, or the most north-eastern portion of the Asiatic Continent, presents a succession of sterile valleys and bare rocks, whose vegetation is limited to that kind of moss which is the food of the reindeer; the climate is excessively cold. South of the country of the Tshooktshes is the peninsula of Kamtchatka.

We shall conclude this survey of Siberia with a few observations on the Polar Sea, which constitutes its northern boundary. Nearly opposite the middle of the coast-line of Siberia is a group of islands, which are called, from their discoverer, the Liakehoff Islands. They consist of four larger and some smaller islands; the larger, viz. Kotelnoï, Fadeyefskoi, New Siberia, and Liakehoff, vary from 100 miles long by 60 broad, to 40 long by 20 broad; the islands are extremely cold, and contain an immense number of fossil bones of elephants and other animals. The sea between these islands and the continent is, even in summer, filled with large masses of ice, which, being impelled by currents and winds, are driven against one another with incredible force. These floating masses render the navigation of the Polar Sea extremely dangerous, and have prevented the coast-line from being thoroughly surveyed. Some discoverers have availed themselves of *nartes*, or sledges drawn by dogs; they set out in the latter part of the winter, from March to the end of May, when the cold is much less severe than in the earlier part of the winter. It has thus been ascertained that in winter the large body of the sea is open and free from masses of ice, but this open water occurs in different parts, at different distances from the shore. The masses of ice in this sea are often covered with salt, where they are free from snow.

Climate.—Siberia is the coldest country in the northern hemisphere, if we except Greenland and the Arctic Archipelago of North America. It is much colder than any part of Europe situated in the same latitude. At the mouth of the river Yana, in 70° 55′ N. lat., the mean annual temperature is as low as 4° or 5° Fahr. The climate increases in severity as we proceed from west to east. So intense is the cold in Eastern Siberia that quicksilver freezes every winter in the country near Irkutsk, and in Yakutsk it remains in a frozen state for two months together, even in mild winters, and in severe seasons for three months. In a large part of Siberia the ground is frozen to a considerable depth, even at the end of the summer. In summer the temperature of Western Siberia is higher than that of Eastern Siberia, which is partly explained by the contiguity of the great Caspian Desert, which in summer is extremely hot.

Rivers.—Siberia has a great number of rivers, and as the whole course of most of them, and the greatest part of the course of the remainder, lies through a level and hilly country, nearly all of them are navigable for a great distance. The principal rivers run from south to north, from the agricultural districts to those where vegetation does not supply food to the inhabitants, and hence their great importance for internal intercourse. The tributaries, at least the greater number and the largest of them, run chiefly east and west, and form a water-communication between the agricultural districts themselves, and render it practicable for goods bought from the Chinese at Maimatshin to be transported to European Russia at nearly the same expense as those which are obtained at Canton are carried to Great Britain. Though all these rivers are frozen for more than six months of the year, the advantages arising from them are not thereby materially diminished, as the ice facilitates communication almost as much as the open water. The most important of the Siberian rivers are the Oby, the Yeneseï, and the Lena.

The *Oby, Obi,* or *Ob,* is the largest river of the Old Continent. Its basin is said to comprehend more than 1,370,000 square miles, and is only inferior to that of the rivers Amazon and Plata in South America. This basin extends from 47° to 74° N. lat., 1890 miles in length, and in the widest part, near 55° N. lat., it is nearly 1200 miles across. The Oby rises in the Altai Mountains with two large branches, the Katunga and the Biya, which collect the waters from an immense area of that mountain-region. After the junction, near the town of Katunsk, the Oby flows successively west, north, north-west, and west, to its junction with the Irtish, receiving in its course the Charysh, Tom, Choolym, and the Ket. The Irtish rises in the Chinese Empire, about 46° N. lat., 87° E. long., and has a generally north-western course until it meets the Oby, receiving the waters of the Buchtarma, the Om near Omsk, the Tobol at Tobolsk, the Ishim, and other rivers. The Oby, after its confluence with the Irtish (about 61° N. lat., 68° E. long.), turns northward and flows in that direction to the vicinity of the polar circle, when, increasing to a great width, it turns east at Obdursk, and falls into the Gulf of Oby by three arms. This gulf is between 70 and 80 miles wide and more than 400 miles long. The Oby supplies a larger quantity of fish than any other river in the world. The entire length of the Oby is about 2400 miles.

The *Yeneseï* is the second river of Siberia in magnitude; its basin covers an area of 1,020,000 square miles. The two remotest branches of the Yeneseï, the Ta-kem and Selenga, originate in the Chinese Empire, among the lofty Altai Mountains; each branch being formed by the confluence of numerous smaller rivers. The Salenga is the more important of the two; it flows 450 miles through the Chinese Empire, then 250 more to Lake Baïkal, and then into the plains of Siberia, where it forms the Yeneseï by a junction with the Ta-kem, in 58° N. lat., 93° W. long. The Yeneseï, after this junction, runs north-west to 60° N. lat., then north to 69°, and again north-west to 70°. Before it reaches 70° N. lat., it enlarges into a wide æstuary full of low islands and shoals, which is called the Gulf of Yeneseï. This gulf is on an average 20 miles wide, and more than 200 miles long. The Yeneseï, which is joined by numerous considerable rivers, has a course of about 2500 miles.

The *Lena,* the basin of which is estimated at 800,000 square miles, rises in the Baïkal Mountains, hardly more than 20 miles from the banks of

Lake Baïkal, and about 50 miles north-east of Irkutsk. It flows past Kotshuga, Olekminsk, and Yakutsk, its course generally being to the N.E. North of 70° N. lat. it enlarges to three or four miles in width; and at its mouth forms a delta, traversed by several arms of the river, three of which form navigable channels. Among the tributaries of the Lena are some very large rivers, the Vitima, the Olekma, the Aldan, and the Vilui. The length of the Lena is about 2000 miles.

Besides these large rivers, there are others of less magnitude, but still so large that they would be considered important in any other country. The AMUR and the ANADYR are noticed in separate articles. The Anakara flows 500 miles, the Olonek 700, the Yana 500, the Indighirka 700, and the Kolyma 700.

Productions.—The vegetable productions of Siberia have been briefly noticed in connection with the different districts. The domestic animals vary greatly in size and form in different districts. This is especially the case with horses and sheep. Among the latter, the sheep kept by the Khirghis Cossacks, in the Steppe of Ishim, are distinguished by their thick tails and fine wool. In 1830 some landed proprietors in the neighbourhood of Irkutsk introduced Spanish sheep, for the purpose of improving the wool of the native sheep.

Siberia is very rich in metals. There are three extensive mining districts. The most western comprehends the mines of the Ural Mountains. These mines are rich in gold, silver, and copper; and they contain also iron, silver, and platinum in smaller quantities. The second mining-district is that of Bernaul. The mines yield much silver and copper, but less gold and lead. The mines from which these metals are obtained lie mostly in the Altai Mountains and in those valleys which open to the Irtish River. The third mining-district is that of Nertshinsk, which is situated on the east of the Yablonoï Khrebet, in the basin of the river Amur. These mines contain gold, lead, silver, iron, antimony, and arsenic. [ALTAI MOUNTAINS, i., 562; RUSSIA, x., 418.]

The western parts of Siberia get the salt which is required for their consumption from the salt lakes in the steppes of Ishim and Barabinsk, in some of which the salt crystallises spontaneously. The countries bordering on the river Lena obtain salt partly from some salt-springs which occur in the vicinity of the town of Ust Kutsk, and partly from the river Vilui. Da-Uria obtains its salt from one of the lakes of the Gobi, called Dabassuneï Lake, not far from that of Khara. Several kinds of precious stones occur in Siberia, and diamonds have been found along the eastern declivity of the Uralian range. The amethysts, topazes, emeralds, and red tourmalines, are of great beauty; zircons of extraordinary size have been found near Miask, south of Ekatarinburg. Lapis lazuli and talc of fine quality are met with.

The tusks of the fossil elephant constitute an article of commerce, and many persons make the discovery of them the business of their life. These fossil bones are deposited in immense masses, which occur more frequently and are of larger extent as we proceed from south to north. They are generally found at a certain depth, mostly in hills of clay, rarely in mould, and never in sand.

Inhabitants.—When the Russians first entered Siberia, they found the country in possession of numerous tribes more or less addicted to a nomadic life; none of them cultivated the ground, and they had no permanent places of abode, with the exception of some Tartars in the vicinity of Tobolsk. Some of these tribes belonged to widely-spread nations, but others, often consisting of a small number of families, constituted separate nations. The small number of individuals in the several tribes rendered them unable to make effectual resistance to the Russians, who gradually subjugated this immense country. In this struggle some of the smaller tribes seem to have entirely disappeared, or perhaps a remnant of them united itself to some neighbouring tribe, and was gradually incorporated. There are still about forty tribes, differing more or less in physical character and in language. Some of them belong to the Caucasian race, and others are akin to the Mongols.

Some of these tribes are described in the articles COSSACKS, KAMTCHATKA, MONGOLIA, SAMOYEDES, TARTARS. The Bashkirs and the Metsheriakes are noticed under RUSSIA. The Ostiaks are a Finnish race, who live chiefly by fishing and hunting. The various tribes of Tartar and Mongol origin partake of the characteristics noticed under TARTARS, MONGOLIA. The Khirghis Cossacks, occupying the Caspian Desert, are only partly dependent on Russia; they belong to the same race as the Turks. The Altai Calmucks are still heathens. The most populous of all the nations that inhabit Siberia, next to the Russian, are the Buriates, who occupy the country on both sides of the Lake of Baïkal, and extend towards the east as far as the western banks of the river Onon. Their priests have a very rich literature, mostly on the subjects of Buddhism, which a great part of the Buriates have embraced, but the classical sacred books are written in Sanscrit. The most widely dispersed of the native nations of Siberia are the Toonguses. The Toonguses are considered as the best formed of the native tribes of Siberia. They are generally of middling size, of a fine shape, and slender. Their face is less flat than that of the Mongols, their eyes small and lively, and their nose well formed, though rather small. Many of them have no beard, and the rest have very little. Their hair is black and lank, and rarely grows gray in old age. They are very accomplished horsemen. Their language nearly agrees with the Mandshu. The Yakutes, a large Turkish tribe, are skilled in agriculture and in some departments of manufactures.

The population of Siberia is now estimated at more than two millions and a half, exclusive of the Middle Horde or Orda of the Khirghis Cossacks, which is computed at more than a million. But this population is very unequally distributed over the surface of the country. Even the most populous districts, namely, the agricultural region in Western Siberia, the vale of the river Yeneseï in Central Siberia, and the plain of the Lower Angara, would be considered very thinly peopled in any part of Europe, but they are thickly inha-

bited when compared with other parts of Siberia, where several tracts occur extending over a surface of from 20,000 to 30,000 square miles, which are entirely uninhabited. The Russian settlers in Siberia exceed in number all the native tribes.

Political Divisions and Towns.—The administration of Siberia is divided into two general governments, those of Western and Eastern Siberia. Western Siberia consists of the governments of Tobolsk and Tomsk and the province of Omsk; and Eastern Siberia of the governments of Yeneseïsk and Irkutsk, and the provinces of Yakutsk, Okhotsk, and Kamtchatka, to which are added the Russian settlements on the western coast of North America as far as 56° N. lat. and 141° W. long. All these divisions are governed by separate officers, who receive their orders from the governor-general, and can only apply to the court of Petersburg through him. A small but very important portion of Siberia is not subject to the authority of the general governor, but is united to the European governments of Perm and Orenburg.

That part of the government of Perm which is on the east of the Ural Mountains, contains nearly all the numerous mines of the mining-district of the Ural. Besides EKATARINBURG, which is the seat of administration for the mines, it contains several remarkable places; among which are Berezow, 2000 inhabitants; Newansk, 10,000; Alpayewsk, 2000; Nishnei Taghilsk, 20,000; Kushwinsk, 6000. Most of the inhabitants of these towns are engaged at the mines. The only important towns in Siberian Orenburg are Chelyabinsk, Miask, and Troitzk.

The government of Tobolsk contains no mines; it is an agricultural and grazing country. The chief town is TOBOLSK. The remaining towns of any importance are Toorinsk, 7000 inhabitants; Tioomen, 10,000; Yalootorovsk, 2000; Koorgan, 1000; Tara, 3600; Surgut, 1500; and Berezow, 3000. Tioomen is the oldest city in Siberia; and near Koorgan are numerous ancient tombs.

The province of Omsk consists properly of two lines of fortifications and of the country of the Khirghis Cossacks. Besides the capital, Omsk, which is a well-fortified town, with 7500 inhabitants, the chief towns and fortresses are Petropawlawsk, Semipalatinsk, Ust Kamenogorsk, and Kar-Karaly.

The government of Tomsk is rich in metals (silver, copper, lead, iron), and in grass in the mountainous part; while the steppe abounds in wild animals, and the eastern districts in agricultural products. The capital is Tomsk, a town containing from 8000 to 9000 inhabitants. Bernaul, on the west and elevated banks of the river Obi, is the centre of the mining industry in the Altai Mountains, as the ore of most of the mines is brought to Bernaul to be smelted, owing to the want of fuel in their neighbourhood. It contains between 8000 and 9000 inhabitants, extensive furnaces, and a school of mineralogy. Many Germans are employed in the town and vicinity, and a German church and school have been erected. Kooznesk, Kolywan, and Biysk, are other towns in this government.

The government of Yeneseïsk is distinguished chiefly for its fishery and its commerce; mining, manufactures, and agriculture being all limited. The chief towns are Yeneseïsk, 5000 inhabitants; Krasnoyark, 3500; Atshinsk, 2000; and Toorookhansk.

The government of Irkutsk is mostly agricultural. The capital is Irkutsk, the residence of the governor-general of Eastern Siberia. This town contains above 20,000 inhabitants. The streets are straight and wide, but not paved; the houses are mostly of timber. The palace of the governor-general, the medical institution, the grammar-school, and the hall of the American Company, are fine buildings. Besides these the town contains a public library, a museum of natural history, a military school, and a school for navigation. Irkutsk is the centre of the commerce of Eastern Siberia. The other towns are Telma, Kotshuga, Verchnei Udinsk (4000 inhabitants), Nertshinsk (1000), Nertshinskoi Sawod (4000), and KIACHTA.

The province of Yakutsk extends over the north-eastern part of Siberia. The capital is Yakutsk, on the west bank of the river Lena, with more than 4000 inhabitants, and an extensive market for furs. The only other places worth naming are Ust Yansk and Nishnei Kolymsk.

The province of Okhotsk extends along the sea of that name. The only towns are OKHOTSK and Ishiginsk.

KAMTCHATKA is described in a separate article.

Manufactures and Commerce.—Siberia possesses tanneries, iron foundries, glass works, and manufactures of coarse woollens and linens; but their number is inconsiderable. There are smelting and refining works connected with the mines.

Though the ocean washes the northern and eastern sides of Siberia, this country has no maritime commerce; partly owing to the ice of the north, and partly to the rocky coast and sterile country of the eastern margin. But Siberia carries on an extensive commerce with Russia, Bokhara, Tashkend, and China. The most important is the trade with Russia. The transport of the goods is effected by a road which leads from Perm in Russia to Ekatarinburg and Tobolsk. The commerce which is carried on at Kiachta with the Chinese has been noticed under KIACHTA. The goods from Irkutsk to Kiachta, and from Kiachta to Irkutsk, are conveyed, from May to November, by large vessels which navigate the Lake of Baïkal and the river Selenga, and in November and December by carts on a mountain road. The inhabitants of Siberia have also some commerce with Kuldsha, the capital of the Chinese government of Songaria, through the agency of the Khirghis Cossacks, who inhabit the country contiguous to the Chinese boundary; and a regular commercial intercourse has been established between Siberia and the khanat of Khokan, by means of caravans passing through the steppes of the Khirghis Cossacks.

There is a considerable commerce carried on between the southern agricultural districts and the northern, which are inhabited by nomadic nations. A great number of Russian merchants

at certain periods, especially in February, visit certain places to which the nomadic nations resort, to buy from the latter their furs and other objects. The Russian merchants give in return flour or bread, and a few manufactured articles. These places of commerce are very small, but are full of people at the time of the fairs. Among these places are Obdursk on the Obi, Toorookhansk on the Yeneseï, Ust Yansk on the Yana, and Ostronoye on the Aniuy, one of the confluents of the Kolyma. The most frequented are the first and the last. The Tshooktshes maintain a commercial intercourse with the tribes of Russian America.

History.—Europeans had not the least knowledge of the existence of Siberia up to 1580. It is however certain that a part of it was conquered by Gengis Khan and his successors. A Cossack chief named Yermák Timoféyew, crossed the Ural with a small marauding band in 1580, and made a rapid succession of conquests till 1584, when he was drowned in the Irtish. After his death his conquests were lost to Russia, but the power of Kutshúm Khan (the Tartar chief of this part of Siberia) had been broken, and he was unable to resume his former position. The Russians continued gradually to gain on him, until his empire was entirely destroyed, and all the country west of the river Obi was subjected to the sway of the Czar. In 1604 the town of Tomsk was built; and although the Siberians made many attempts to crush the Russian power at this time, they failed. The Russians sent out small parties from time to time, which at length conquered the immense territory as far as the Pacific Ocean at Okhotsk. All this was effected in sixty years. The populous nation of the Buriates had been attacked and partly conquered in 1620, but they frequently rebelled, and their complete submission was not effected before 1658. Soon afterwards the town of Irkutsk was built by Iwan Pochaboff (1661). The whole of these conquests were made by Cossacks, for the sake of plunder, without expense to the government. The conquest of Da-Uria involved the Russian and Chinese governments in disputes, which were however terminated by a treaty in 1689. This treaty determined the boundaries between the two empires; and it has been confirmed by the treaty of 1727, in which Kiachta and Maimatshin were appointed as the only places where a commercial intercourse between the two countries should take place. At the same time Russia obtained permission to send every ten years a spiritual embassy to Peking.

SIBTHORP, JOHN, the youngest son of Dr. Humphrey Sibthorp, professor of botany at Oxford, was born in that city Oct. 28, 1758. He took his master's degree in 1780, and afterwards obtained a Radcliffe travelling fellowship. In 1783 he took the degree of M.B.; and, leaving Oxford for a time, pursued his medical studies at Edinburgh. He next visited France and Switzerland, and made some interesting botanical discoveries at Montpellier, which he communicated to the Academy of Sciences in that city.

In 1784 he returned to England, and having taken the degree of Doctor of Medicine, was appointed to succeed his father, who had resigned the professorship of botany. Part of the same year was spent at Göttingen, where he formed the plan of his voyage to Greece, which he soon afterwards executed.

On his return home after about a year's absence he again engaged in the duties of his professorship. He was one of the first members of the Linnæan Society, and became a fellow of the Royal Society in 1789. His reputation gained him an increase of his stipend, with the title of Regius Professor, which was conferred on him in 1793. But nothing could deter him from attempting to accomplish his purpose of forming a complete Flora of Greece. Accordingly, in March, 1794, he set out on his second journey to that country. He passed the winter of 1794 at Zante, where an apothecary furnished him with a complete Herbarium of the island. In February, 1795, he left Zante for the Morea, where he remained for two months, and returned to Zante at the end of April. He here embarked on board a vessel bound for Otranto. The voyage, which is usually accomplished in five days, occupied more than three weeks; and the inclemency of the weather to which Dr. Sibthorp was exposed hastened the progress of a consumption, of which he had before experienced the symptoms. In the autumn of 1795 he again reached England, but owing to a tempestuous voyage and inclement weather his health grew rapidly worse; and on Feb. 8, 1796, he died at Bath, in the 38th year of his age.

Of the value and extent of Dr. Sibthorp's labours some notion may be formed from the fact that the number of species collected from his manuscripts and specimens amounts to 3000. Unhappily, he lived to finish only one work, a 'Flora Oxoniensis,' published in 1794. In his will he bequeathed to the University of Oxford an estate of 200*l.* a year, for the purpose of publishing his 'Flora Græca,' in 10 folio volumes, with a hundred plates in each; and a prodromus of the work, without plates. One volume of the 'Flora,' in folio, and one volume of the 'Prodromus,' in 8vo., were published at Oxford in 1808.

SIBTHO'RPIA, a genus of plants named after Dr. Humphrey Sibthorp, formerly professor of botany at Oxford. This genus consists of small creeping, rooting, tufted herbs. One of the species, *S. Europæa*, is a native of Europe, and is found in Portugal, Spain, and France, and in Devonshire and Cornwall in England.

SIBYL (Σίβυλλα) is the name by which several prophetic women were designated, all of whom belong to the mythical ages of ancient history. But Pausanias (x. 12), who gives an account of the sibyls, applies the same name to female soothsayers of the historical times. In more correct language however the name is only applied to mythical personages. The Sibyl of Cumæ, in Campania, has acquired more celebrity than any other. The ancient legend is this. In the reign of Tarquinius Priscus, or, according to others, in that of Tarquinius Superbus, there appeared before the king a woman, either herself a sibyl or sent by a sibyl, who offered to the king nine books for sale. The king refused to purchase them, where-

upon the woman burnt three of the books, and returning, asked for the remaining books the same price as she had asked for the nine. The king again declined purchasing; but when the woman, after burning three books more, returned and asked for the three remaining the same price which she had before asked for the nine, his curiosity was excited, and he purchased the books; whereupon the strange woman vanished. These three books were the Sibylline Books which play such a prominent part in the history of Rome. The Sibylline Books were kept in the temple of Jupiter Capitolinus, where they were preserved in a stone chest, and under the care of especial officers (duumviri sacrorum, interpretes, or sacerdotes sibyllæ), who had been appointed by the Tarquinius who purchased the books. These officers had to consult the Sibylline Books (adire libros sibyllinos) on all occasions when the gods manifested their wrath by inflicting calamities upon the Romans. Subsequently the number of keepers of the Sibylline Books was increased to ten, and in Sulla's time to fifteen. They consulted the sacred books when they were authorised by a senatus consultum. In B.C. 83, the temple of Jupiter was burnt, and the sacred books in it; but a new collection of Sibylline verses were made by sending to various towns in Italy, Greece, and Asia Minor. These mysterious verses were guarded with care under the empire; but the collection was burnt again in the time of Nero; and again it was restored. In A.D. 270 we read of a proposal made in the senate to consult them. About the same time the Christians, in their zeal to convert the heathens, began to refer to the Sibylline oracles as containing prophecies respecting the Messiah. The collection which was in the keeping of the state was burnt a third time in the reign of Julian (A.D. 363); and a fourth time in the reign of Honorius, by Stilicho, A.D. 395. (Rut., 'Itin.,' ii. 51.) But it was restored each time; and notwithstanding all the forgeries which must have crept into it, the collection continued to be held in great esteem, as it was a useful instrument in the hands of the various parties, political as well as religious. Hence we find them consulted even as late as the middle of the sixth century of our æra.

A complete collection of Sibylline verses was compiled and edited by Gallæus, Amsterdam, 1689, 4to.; but it contains a great many spurious verses, and such as were made by the early Christians who pretended to be inspired. In 1817, A. Mai published a collection of fragments from the Sibylline Books, which he discovered in a MS. of the library at Milan. Another collection of fragments was published by C. L. Struve, under the title 'Sibyllinorum Librorum Fragmenta,' Regiomont., 1818, 8vo.

SICARD, ROCH AMBROSE CUCURRON, was born at Fousseret, near Toulouse, Sept. 20, 1742. He completed his studies at Toulouse, and entered into holy orders. The Archbishop of Bordeaux soon afterwards wished to establish a school for the deaf and dumb, and he fixed upon the Abbé Sicard to second his project. Sicard went to Paris to learn the method of instruction there pursued by the Abbé de l'Epée. He returned to Bordeaux in 1786, and the new establishment prospered under his care. This success obtained for him the preferment of vicar-general of Condom, and also of Canon of Bordeaux. The various literary honours which were likewise conferred upon him did not however cause him to relax in his zeal for the education of the deaf and dumb, in which pursuit he became so distinguished that he was chosen successor at Paris of the Abbé de l'Epée, who died in 1789. In 1791, though willing to acknowledge liberty and equality, Sicard fell under suspicion of being a royalist. He was arrested Aug. 26, and imprisoned in L'Abbaye Sept. 2. During two days and two nights he remained in prison, in imminent danger of being massacred; and it was only by the decisive steps taken by several of his friends in the Assembly that his life was saved. After this he was suffered to pursue his labours without interruption; and when a normal school was established, soon after the fall of Robespierre, he was appointed a teacher of grammar. He was soon afterwards engaged in contributing to and otherwise assisting in the publication of political and religious papers in various periodicals, was brought under the notice of the Directory, and banished. It was a considerable time before he was restored to his pupils. On his return he set up a printing-press in the institution, had his works printed by the pupils, and from that time employed himself solely in perfecting the methods of instruction transmitted to him by his illustrious predecessor. The Abbé de l'Epée had translated things by signs, and signs by words, and he had applied his system only to physical objects. Sicard applied it to metaphysical ideas also, and thus succeeded in giving to his pupils that development of intellect of which he found them capable. The chief works of Sicard are his 'Théorie des Signes,' 'Cours d'Instruction d'un Sourd muet de Naisance,' and 'Elemens de Grammaire Générale appliquée à la Langue Française.' He wrote and translated several other works, and he was a member of most of the learned societies of his time. In 1815 he visited England with Massieu and Clerc, and was very honourably received and noticed. He died in May, 1822.

SICILIAN VESPERS. [ANJOU, COUNTS AND DUKES OF.]

SICILIES, TWO. *The United Kingdom of the Two Sicilies* (*Regno Unito delle Due Sicilie*) is the title of a monarchy, which comprises the southern part of the Italian peninsula, being nearly one-third of continental Italy, and also the island of Sicily. It is the largest and most populous of the Italian States. An account of the continental part is given under NAPLES, KINGDOM OF. The island is described under SICILY. The area of the whole kingdom is estimated at 41,800 square miles, and the entire population in 1845 was 8,423,316.

The Sicilian monarchy originated with the Norman conquest of Sicily and Apulia, in the latter part of the 11th century. Robert Guiscard or Wiscard, a Norman, and a distinguished warrior in the middle ages, was the founder of the

Sicilian monarchy. The Norman dynasty terminated in 1194, when Henry VI., Emperor of Germany, obtained possession of the kingdom. It continued in possession of his successors till 1266, when Charles of Anjou, having defeated Manfred, was acknowledged king of Sicily, Calabria, Apulia, &c. In 1282 the Sicilian Vespers occurred, or general massacre of the French in Sicily, when Pedro, king of Aragon, who had married the daughter of Manfred, was called to the throne. The kings of Aragon ruled Sicily till 1503, when Naples was added to it under Charles V. From this period till 1713 these two countries were ruled by Spanish viceroys. By the treaties of Utrecht, the Archduke Charles of Austria, then Emperor of Germany, obtained Naples, Sardinia, and Milan; and by the express intervention of Queen Anne of England, Sicily was given to Victor Amadeus of Savoy, with the title of king. By a new arrangement in 1718, Sicily was transferred to the Emperor; and Naples and Sicily have ever since been under the same crown.

The present dynasty was the beginning of a new æra for the countries of Naples and Sicily. They resumed their rank as an independent monarchy, and also their nationality, which is an essential condition to the well being of a people. In 1816 Ferdinand IV. of Naples assumed the title of Ferdinand I., King of the United Kingdom of the Two Sicilies, and the legislation and administration of both divisions of the kingdom were reduced to a uniform system. The present king, Ferdinand II., succeeded his father, Francis I., in Nov. 1830.

The foreign commerce of this state is briefly noticed under Messina; Naples; Palermo. The whole kingdom, including Sicily, is divided into 74 districts, and 2247 communes.

SICILY, a large island in the Mediterranean Sea, which is separated by a narrow channel, called Faro di Messina, from the coast of Calabria. It is in the shape of a triangle, of which the northern and southern sides are each about 175 miles long, and the eastern 115 miles. The nearest point of Calabria is 3 miles distant, and the nearest point of Malta 60 miles. The area is 10,200 square miles. The population in 1845 was 2,040,610.

Surface.—A succession of mountain groups extend across the island from east to west, having the names of Monti Dinamari, Heræi Montes, Monti Madonia, the Cratas, and Trapani, the ancient Eryx. Few summits in Sicily, with the exception of Ætna, exceed 4000 feet in height. Towards the eastern coast rises the detached group of Ætna. At the southern base of Ætna lies the plain of Catania, the largest in the island. There are smaller plains along the southern coast, near Alicata, Terranova, Marsala, and at Melazzo on the northern coast; but the larger part of the surface of the island consists of mountains and valleys. The northern coast is generally high, the mountains in many places coming close to the sea. Few of the rivers are perennial. Of these few the principal are, the Giaretta, or Simæthus, which flows eastward through the plain of Catania; the Fiume Salso, the ancient Himera, which flows southward, and enters the sea near Alicata; and the Belice, or Hypsa, which flows into the sea near Selinunte, the site of the ruins of Selinus. Most of the rest are torrents, with a short and rapid course, dry or nearly so in summer, but swelling into formidable floods in the rainy season, when, from the want of bridges, they become impassable for days together.

Most of the mountains have been in the course of ages stripped of their ancient forests, and they now present a naked and barren appearance.

Sicily has no lakes except that of Biviere, near the east coast, between Catania and Syracuse, which is about twelve miles in circumference, and abounds with fish; and the lake of Pergusa, near Castrogiovanni, in the centre of the island, which is about four miles in circumference. The sea around the coast of Sicily abounds with fish of various sorts, but the most productive fisheries are those of the sardine and tunny.

The mineral productions of Sicily consist of copper, silver, cinnabar, and sulphur, of which last a large quantity is exported to Great Britain, marble, alabaster, and rock salt.

The cultivation of corn is said to occupy about one-half of the tilled land. Barley, Indian corn, and beans, are cultivated. A great deal of wine is made in Sicily, of which the Marsala is best known in England. Dried raisins are exported from Messina. Messina is also the depôt for the currants of the Lipari Islands, of which about 12,000 barrels are yearly sold and exported to Trieste, England, and America. Oranges and lemons are fine and plentiful. Olive oil and linseed oil, lemon-juice, as well as essences of lemon and other fruits, are made for exportation. A little silk is produced. Liquorice-juice is made in large quantities. Manna, almonds, pistachio nuts, sumach, and figs, are among the produce exported. Kid and lamb skins are dressed for exportation. The cattle, sheep, and horses, are mostly of inferior breeds, and not in good condition.

Divisions, &c.—Sicily was formerly divided into three divisions, called Valli:—Val di Mazzara, in the west; Val di Demona, in the east; and Val di Noto, in the south. It is now divided for administrative purposes into 22 districts and 407 communes. For scientific instruction there are three universities, Palermo, Messina, and Catania; and upwards of 20 colleges in the provincial towns; but elementary instruction is much neglected. The ecclesiastical establishment consists of 3 archbishops, 11 bishops, 13 abbots, and about 30,000 secular priests. No other form of worship is allowed in Sicily than that of the Roman Catholic Church. At the head of the political administration of Sicily is a lieutenant-general, who represents the king's person, and is often a member of the royal family.

The manufactories of Sicily are neither numerous nor on a large scale. Cotton-cloth is manufactured at Messina, Catania, Palermo, and Caltagirone; silks at Palermo, Catania, and Nicolosi; leather at Messina; gloves, soap, artificial flowers, and paper, at Palermo; coral from the coast of Africa is wrought at Trapani.

The merchant vessels of Sicily, most of which are coasting vessels, amount to about 1400, besides fishing-boats. The maritime trade of Sicily is carried on chiefly in Genoese, Austrian, French, Spanish, and other foreign ships.

Towns, Islands, and Harbours.—The principal towns of Sicily are:—Palermo, Messina, Catania, Syracuse, Agosta, Trapani, Girgenti. Other towns of less importance are noticed under the Intendenzas or Provinces of Messina, Palermo, Catania, and Girgenti. Marsala, Alcamo, Bronte, and Alicata, are under their respective heads.

The other towns which deserve notice are the following:—*Castelvetrano*, near the site of the ancient Entella, a town of 12,000 inhabitants, in a romantic situation on a hill in the province of Trapani: the ruins of the ancient Selinus are a few miles south of Castelvetrano, near the sea-coast. *Mazzara*, a bishop's see, and a town of 10,000 inhabitants. *Caltanisetta*, a considerable town in the interior of the island, with above 20,000 inhabitants, and numerous churches and convents. *Caltabellotta*, a town of 7000 inhabitants, on a hill north of Sciacca. *Castrogiovanni*, near the site of the ancient Enna, a town of 12,000 inhabitants. *Calataxibet*, or *Calascibetta*, a town of 6000 inhabitants, in the centre of the island, near Castrogiovanni. *Terranova*, near the site of the ancient Gela, on the south coast of the island, with about 9000 inhabitants, carries on a considerable trade by sea. *Modica*, the capital of one of the finest and best-cultivated districts in all Sicily, has numerous churches and convents, and about 24,000 inhabitants. The finest cattle in Sicily, the finest wool, and the best cheese and butter, belong to the district of Modica. *Piazza*, with 18,000 inhabitants and a bishop's see, situated on a hill half-way between Castrogiovanni and Caltagirone. *Noto*, in the south part of the island, a considerable town, with numerous convents and churches, and 18,000 inhabitants. *Castellamare*, on a gulf on the northern coast, between Palermo and Trapani, has a strong castle, 4000 inhabitants, and large granaries: it carries on a considerable trade by sea. *Palma*, a well-built town, on a hill not far from Alicata. *Salemi*, a town in the west part of the island, built by the Saracens, near the site of the ancient Alicia, has about 12,000 inhabitants. *Lentini*, the ancient Leontini, has 6000 inhabitants and some good buildings; but the air is considered unhealthy in summer. *Carlentini*, with 4000 inhabitants. *Geraci*, north-west of Nicosia, with 4000 inhabitants. Besides these, there are many other towns of less note, such as Calatafimi, Partanna, Leonforte, Ragusa, Naro, &c. Sicily has many towns containing above 3000 inhabitants, as the country population live chiefly in towns, and not in cottages dispersed about the country.

The small islands belonging to Sicily are the two groups of Lipari and Trapani, and the single islands of Ustica, Pantellaria, Linosa, and Lampedosa. The Lipari Islands are described in a separate article. The Trapani group comprises Favignana, Maretimo, Levanzo, Formica, Scoglio di Mezzo, Motya, and several smaller. Favignana is the largest and most fertile island of this group. The island of Ustica is about 11 miles in circumference, and has a thriving population. Pantellaria is about 36 miles in circumference. The ground is in great part of volcanic formation, and produces vines and olive trees, cotton, pulse, and pasture, but little corn. The inhabitants, to the number of 3500, are remarkably industrious. Linosa and Lampedosa are uninhabited.

The best harbours on the coast of Sicily are those of Messina and Syracuse, which are perfectly safe; and the latter particularly is capable of containing a fleet of large ships of war. The ports of Palermo, Agosta, and Trapani are next in importance. But the southern coast is destitute of harbours.

History.—The Siculi (Σικελοί) came from Italy, and occupied the eastern part of Sicily about 300 years before the Greeks made any settlement in the island. The Phœnicians, the Elymæi, the Chalcidians, the Megarians, the Corinthians, the Rhodians, the Cretans, all in succession formed colonies on the coast. The interior of the country remained in possession of the Siculi, under their respective princes. The Greek towns governed themselves at first as republics, mostly aristocratic; afterwards some citizens rose to be tyrants or permanent chief magistrates. At the time of the first invasion by the Carthaginians (480 B.C.) Syracuse and Agrigentum were the preponderating states. The struggles between the Carthaginians and the chief Sicilian states are narrated under Agrigentum; Agathocles; Gelon; Hieron; Dionysius; Pyrrhus; Syracuse; while the contests between the Romans and the Carthaginians for the possession of Sicily belong to the history of the Punic Wars. The Carthaginians held all Sicily, except Syracuse, from 406 to 241 B.C.; when they were driven out by the Romans, who took possession also of Syracuse in 212 B.C., by which the whole of Sicily came under the Roman power.

About A.D. 440 the Vandals under Genseric landed from Africa on the western coast of Sicily and took Lilybæum. Theodoric, the Gothic king of Italy, added Sicily to his continental dominions. In the year 534 Belisarius reconquered Sicily for the emperor Justinian. In 827 the first Saracen expedition landed in Sicily, took Agrigentum and Minoa, and, after several years' fighting, took Messina in 831, and Panormus in 835. It was not till 878 that the Saracens took Syracuse by storm. Sicily remained in the hands of the Saracens until the invasion and conquest by the Normans. [Sicilies, Two.]

The Saracens never formed the bulk of the population in Sicily. There are sufficient grounds to believe that they did not muster at any time more than between 200,000 and 300,000, or about one-sixth of the actual population. The Christians enjoyed the free exercise of their religion, paying a tribute like other conquered subjects in Mohammedan states. They had their bishops and their convents. But they had no political rights, and were subjects of the conquering race.

SICYON and SICYONIA, the territory of Sicyon. Sicyonia was situated on the south coast of the Corinthian Gulf, and near the eastern extremity of the gulf. In the time of Strabo the river Némea was the boundary on the E. between Corinthia and Sicyonia. On the W. it was bounded by the territory of Palléne (Herod., i. 145), and on the S. by the territory of Phlius. Sicyonia consisted of a plain country along the coast and a higher tract extending a few miles inland. The area perhaps fell short of 100 square miles. The old town of Sicyon was on the coast, and it became the port when the new town was built a short distance inland. When Pausanias visited Sicyon in the second century of the Christian æra, it still contained works of some of the great sculptors of Greece.

The political history of this small state is unimportant; but it was the birthplace of Arátus.

As a school of art, Sicyon holds a distinguished rank; and one of the great styles of painting took its name from this little state. This school was founded by Eupompus, and it produced Pamphilus and Apelles. Sicyon was also one of the most ancient seats of the plastic art. Lysippus was a native of Sicyon.

SIDA, a genus of the natural family of *Malvaceæ*, containing nearly two hundred species, which are very extensively distributed throughout the warm parts of the world, and abound in Hindustan and other parts of India. The species of this genus vary much in habit, as well as in the structure of their fruit and seeds, but they resemble each other, as indeed do all Malvaceous plants, in abounding in mucilage, and in some of them having tough ligneous fibres, which are employed for the purposes of cordage in different countries.

SIDDONS, MRS. SARAH, was born at Brecon, in South Wales, July 5, 1755. She was the eldest child of Mr. Roger Kemble, and, while a mere infant, made her first appearance on the stage on the occasion of her father's benefit. From that period Miss Kemble continued to perform regularly in her father's company till she attained her fifteenth year. Having formed an attachment to a young actor named Siddons, which was not approved of by the family, Miss Kemble was removed from the theatre, and placed under the protection of Mrs. Greathead, of Guy's Cliff, Warwickshire. The young couple however were married at Coventry, Nov. 26, 1773, and the bride returned to the provincial stage at Cheltenham in company with her husband. Here she attracted great attention; Garrick sent King from London to see her; and she made her first appearance in London at Drury Lane, Dec. 29, 1775, in the character of Portia, in the 'Merchant of Venice:' Garrick performed Shylock. She was announced simply as a 'young lady;' and, though favourably received, failed to make any strong impression. Her next performance was as Lady Anne in 'Richard III.,' in the course of which she disobeyed a stage direction, lost the favour of Garrick, and with it her chance of a re-engagement. In the summer of 1776 she appeared at Birmingham. From Birmingham she went to Manchester, York, and Bath, increasing her reputation to such a degree that offers were again made to her from the metropolis; and on Oct. 10, 1782, she reappeared at Drury Lane, as Isabella, in the 'Fatal Marriage,' followed up by a succession of triumphs in other characters which established her fame. At the end of the season she went to Dublin, where her brother John Kemble was engaged. In 1783 the celebrated trial of skill took place between the rival Lady Randolphs, Mrs. Crawford, at Covent Garden, and Mrs. Siddons, at Drury Lane, and added another leaf to the laurels of the latter. On Feb. 2, 1785, Mrs. Siddons first performed Lady Macbeth. In 1794 she opened Holland's new Drury Lane Theatre by the performance of Lady Macbeth, on which occasion her brother Charles Kemble made his first appearance in the character of Macduff; and, in 1809, she again, as Lady Macbeth, assisted at the opening of the present Covent Garden Theatre, Sept. 18. On June 29, 1812, Mrs. Siddons took her leave of the stage in the character of Lady Macbeth. Thrice again however during the next season she was induced to revisit the scenes and revive the recollections of her former glories.

In Nov. 1815 she acted for ten nights at Edinburgh for the benefit of the widow and family of her son Henry; again at Covent Garden, four times in 1816, for benefits and charities. In 1817 she performed once (June 5) for Mr. C. Kemble's benefit, and made her last appearance upon any stage at Covent Garden, June 9, 1818, for the benefit of Mr. and Mrs. Charles Kemble, in the character of Lady Randolph. For two seasons after her public farewell in 1812, Mrs. Siddons gave occasional readings in London, alternately from Shakspere and Milton. She died June 8, 1831, at her residence in Upper Baker Street, London.

SIDE. In modern mathematics this term means nothing but one of the lines which bound a figure, extending from one angle or corner to the next.

In common language side is a vague term, and is also used differently in and out of composition. First we have the *in*side and the *out*side; then, with reference to either of these, we have sides before and behind, above and below, right and left. The first pair is defined by reference to the spectator, the second by the direction of gravitation; but the third, with reference to which the term side is most frequently used, cannot be defined by the mathematician. The anatomist will say that, in the human body, the right side is that on which the heart is not, and the left side that on which it is, and there is no other definition. In every case in which the terms right and left are applied, there is a reference to the position of the human body. Thus the right wing of an army means that which is towards the right hands of those in the centre; as soon as a retreat commences, the names of the right and left wings are changed. The right bank of a river is by convention named on the supposition that the person who names it is looking down the stream, or seeing the water flow from him. Perhaps some may doubt whether the superior and inferior parts, or the anterior and posterior, are in our language properly called

sides. It must be observed however that the words fore-side and back-side are very good English; and that in the phrase *upside-down* we see the remains of the corresponding phrases up-side and down-side.

SIDEREAL (from *sidus*, a constellation; *sideral* would be more correct), applied in astronomy to distinguish that which has reference to the fixed stars from that which relates to the sun, moon, planets, or comets.

SIDERI'TIS, the name of a genus of plants belonging to the natural order *Lamiaceæ*. The species of this genus are numerous, and are inhabitants of Europe and the northern parts of Asia. Dioscorides mentions three species of Sideritis, which were celebrated for stanching blood and healing wounds. *S. Romana*, Roman Ironwort, is a native of the Mediterranean. It was found by Dr. Sibthorp in Greece and the isles of the Archipelago; and Sir J. E. Smith believes it to be identical with the *Sideritis* of Dioscorides. It flowers from June to August, and attains a height of about six inches. *S. Canariensis*, Canary Island Ironwort, attains a height of from three to six feet, and is often cultivated in our gardens. Another species frequently grown in gardens is the Syrian or Sage-leafed Ironwort (*S. Syriaca*): it is a native of Candia and Palestine, and grows to the height of from 12 inches to 18 inches.

SIDERO'XYLON, a genus of plants belonging to the natural order *Sapotaceæ*. Species of this genus are natives of Africa, America, the East Indies, and Australia. They are remarkable for the hardness and weight of their wood, which sinks in water, and the genus has hence derived the name of Iron-Wood.

SIDMOUTH. [DEVONSHIRE.]

SIDMOUTH, HENRY ADDINGTON, VISCOUNT, was the son of Dr. Anthony Addington, a physician of some eminence. He was born May 30, 1757. He commenced his classical education at Winchester School, and was entered at Brazenose College, Oxford, in 1774. He took his degree of B.A. in 1778. On leaving the University he entered himself a student of Lincoln's Inn, and was called to the bar May 11, 1784.

His father's connection with the family of Lord Chatham had led to an intimacy while they were yet boys between him and the younger William Pitt, at whose suggestion he stood for Devizes, and was elected member in the parliament which met May 18, 1784.

He now became one of the steadiest of Mr. Pitt's supporters; and when the office of Speaker was vacant in May, 1789, Addington was elected by a large majority. He filled the chair till, on the retirement of Pitt, in March, 1801, he was induced to undertake the formation and chieftainship of a new ministry, with the offices of Chancellor of the Exchequer and First Lord of the Treasury.

The most memorable event of Mr. Addington's short administration was the Peace of Amiens. Soon after the renewal of the war in the beginning of 1803, Pitt, who had hitherto supported his old friend, began to intimate an apprehension that he was scarcely equal to the crisis, and then joined Fox and the opposition. The result was that Addington resigned, and Pitt was restored to power in May of the following year.

The new government was supported by Addington, who, in January, 1805, again took office as President of the Council, being at the same time made a peer by the title of Viscount Sidmouth. The presidency however he resigned in the July following.

When Mr. Fox and Lord Grenville succeeded to power in Feb. 1806, after the death of Pitt, Lord Sidmouth was made Lord Privy Seal; and when the ministry was reconstructed in Oct. he was replaced in his former post of President of the Council, which he held till the breaking up of Lord Grenville's government in March following. In April, 1812, in the last moments of Mr. Percival's administration, he was appointed President of the Council for the third time. In June of the same year, when Lord Liverpool assumed the premiership after the assassination of Mr. Percival, Lord Sidmouth became Secretary of State for the home department.

His conduct while holding this office exposed him on several occasions to a good deal of popular outcry and obloquy; but he at least succeeded in preventing the public safety from being seriously endangered. He finally retired from official life in 1824; but continued for some years to attend frequently in the House of Lords, though he seldom spoke. He died Feb. 15, 1844, at his residence, the White Lodge, in Richmond Park.

SIDNEY, SIR PHILIP, was born Nov. 29, 1554, at Penshurst in Kent. He was the son of Sir Henry Sidney, and was placed at school at Shrewsbury. In 1569 he was entered at Christ Church, Oxford, and is said to have held a public disputation with Carew, the author of the 'Survey of Cornwall.' In 1572 Sidney proceeded on his travels. Paris was his first halting-place; but on the occasion of the Massacre of St. Bartholomew he was obliged to shelter himself at the house of Sir Francis Walsingham, the English ambassador. After quitting that city, he visited Belgium, Germany, Hungary, and Italy. On his return home in May, 1575, Sidney at once became a courtier, and a very successful one.

Connected with this success is his first literary attempt, a masque, entitled the 'Lady of May,' which was performed before Queen Elizabeth at Wanstead House in Essex.

Sidney rose in favour. In 1576 he was appointed ambassador to the court of Vienna, and returned to England in 1577. Soon after his return, when it was supposed that the queen was favourably disposed towards the negociation for her marriage with Henry, duke of Anjou, Sidney addressed to her the celebrated 'Remonstrance.' Soon afterwards a quarrel at tennis with the Earl of Oxford occasioned Sidney's retirement from court. Wilton, the seat of his brother-in-law the Earl of Pembroke, was his retreat, and during this retirement the 'Arcadia' was written. This work was published in 1590, under the title of the 'Countess of Pembroke's Arcadia.' It was universally read and admired at the time of its

publication, but is now, like most of its class, almost forgotten. In 1581 the 'Defence of Poesie' was composed, but did not appear until 1595.

In 1583 he married Frances, only daughter of his old friend Sir Francis Walsingham.

During the war between the Spaniards and the Hollanders, the queen, in order to mark her sense of his merits, in 1585, appointed him governor of Flushing. After some successes against the enemy the troops under his command encountered a force of about 3000 men who were marching to relieve Zutphen, a town of Guelderland. During the engagement, which took place almost under the walls of the town, Sidney received a wound from a musket-bullet in the left thigh. The anecdote related by Lord Brooke of his conduct on leaving the battle-field, when, faint and bleeding himself, he handed his untasted water to a dying soldier, saying, 'Thy necessity is yet greater than mine,' illustrates his general character. The wound was mortal, and after many days of severe suffering he died at Arnheim, Oct. 7, 1586.

The last edition of his miscellaneous works is Gray's, published at Oxford in 1829.

SIDNEY, or SYDNEY, ALGERNON, was the second surviving son of Robert, second earl of Leicester of that creation. He is supposed to have been born in 1621. Sidney's first entrance upon public life was in 1641, when, upon the breaking out of the rebellion in Ireland, he went over to that country, of which his father was then lord-lieutenant, and commanded a troop of horse. Both he and his elder brother, the Lord Viscount Lisle, distinguished themselves by their gallantry in the campaigns of that and the following year.

Returning to England in August, 1643, the two brothers joined the parliamentary party; and Algernon received a commission as captain of a troop of horse in the regiment of the Earl of Manchester. In April, 1645, Fairfax raised him to the rank of colonel, and gave him a regiment; and in 1646, his brother Lord Lisle having become lieutenant-general of Ireland, he was made lieutenant-general of the horse in that kingdom, and governor of Dublin. In the beginning of the same year he had been returned member for Cardiff, and was soon after appointed governor of Dover. In 1648 he acted as one of the judges at the trial of the king, although he was not present when the sentence was passed, nor did he sign the warrant for the execution. On the establishment of the protectorate however he retired from public affairs.

On the restoration of the Long Parliament in May, 1659, Sidney again came forward, and on the 13th of that month was nominated one of the council of state. On the 5th of June following, he was sent to Denmark, to negociate a peace between that country and Sweden; and he was absent upon this mission when the king returned.

Deeming it imprudent to return to England, he proceeded to Hamburg, Frankfort, and thence to Rome, where he proposed to take up his residence. In 1665 he was at the Hague, along with other English exiles of the same principles; and the next year he is found at Paris, impressing upon Louis XIV. the advantage France would derive from the establishment of a republic in England: a project in favour of which he engaged to procure a rising, if he were allowed a grant of 100,000 crowns. From this time he appears to have resided in Gascony, till at last, in 1677, a pardon and permission for him to return home were obtained from Charles II., on the plea that he was anxiously desirous to see his aged father before he died. The earl died that same year, and, although he had never approved of the course his son had taken, left him a legacy of 5100*l*.

Sidney was a candidate for the representation of Guildford, at the general election in 1678, and for Bramber at that in 1679; but was defeated both times. He had openly taken his stand as the opponent of the court; and he was looked upon as leagued with Monmouth, Shaftesbury, Russell, Essex, and the other popular leaders. When the Rye-House Plot was announced [RUSSELL, WILLIAM, LORD], in June 1683, Sidney was immediately arrested, along with his friend Lord Russell, and committed to the Tower on a charge of high treason. He was brought up to the King's Bench to plead, Nov. 7, and his trial took place on the 21st, before Sir George Jefferies. He was found guilty, and beheaded on Tower Hill, Dec. 4, 1683. No one ever suffered with more firmness or with less parade.

This event seems to have shocked the public feeling of the time in no ordinary degree. Even the cautious Evelyn admits the injustice of the sentence. The attainder was reversed after the Revolution, by the 7th Private Act of the first session of the first parliament of William and Mary.

Sidney's 'Discourses concerning Government' were first published in 1698. The two editions of his works, of 1751 and 1772, both contain 'Letters of the Honourable Algernon Sydney to the Honourable Henry Savile, Ambassador in France, in the Year 1679, &c., now first printed from the Originals in Mr. Sydney's own Hand,' which originally appeared in an octavo volume at London in 1742. Collins states that several treatises by Sidney in Latin and Italian, and also an 'Essay on Virtuous Love,' in English, remain in his own handwriting at Penshurst. There is a 'Life of Algernon Sydney,' by George Wilson Meadley, 8vo., Lond., 1813.

SIDNEY-SUSSEX COLLEGE, Cambridge, was founded in 1596, on the site of a monastery of Gray Friars, pursuant to the will of Frances Sidney, countess of Sussex, who died in 1589. It was intended to support a Master, 10 Fellows, and 20 Scholars; but the estates being found inadequate, after defraying the building expenses, the number of Fellows was reduced by the executors to 7. Two more however were afterwards added by Sir John Hart, citizen of London. Besides these 9 Foundation Fellowships (which are open to the natives of any part of her Majesty's dominions), two were founded by Mr. Peter Blundell, for the benefit of his scholars in this college; and one by Mr. Leonard Smith, the nomination to which is vested in the Fishmongers' Company of London. As this is a divinity college, all the Fellows are obliged to take orders

within three years after their election, and the degree of B.D. at the regular time prescribed by the University statutes. The college has 20 Foundation Scholarships perfectly open. There are 6 other scholarships and several exhibitions.

The college is situated on the east side of Bridge Street. It is entered by a neat portico, and consists of two courts built of brick, which were completed in 1598. The chapel and library were rebuilt in 1780.

In 1848 Sidney-Sussex College had 130 members on the boards.

SIDON, or ZIDON, the most ancient, and for a long time the chief city of Phœnice, and probably the mother-city of Tyre. It lay on the coast of the Mediterranean, in a plain about a mile broad, 200 stadia from Tyre. (Strabo, 756; Joseph., 'Antiq.,' v. 3, 1.) It possessed a good harbour, and at a very early period became a great maritime and commercial city. The Sidonians are supposed to have been the first manufacturers of glass, and their skill in arts and manufactures is frequently referred to by Homer, as well as by later writers. They were worshippers of the goddess Ashtoreth, whose head is commonly found upon their coins.

Sidon was gradually eclipsed by Tyre, which became the chief city of the Phœnicians. Still it was an important place, and furnished the best ships for the fleet of Xerxes, B.C. 480, at which time it was governed by a person whom Herodotus calls a king (viii. 67). After being burnt and rebuilt in the time of the Persian king, Artaxerxes Ochus, it submitted to Alexander of Macedonia. Finally it fell into the hands of the Romans.

It is still called Saida, and has a considerable trade, and about 8000 inhabitants.

SIDO'NIUS APOLLINA'RIS, a Latin writer, or with his full name, *C. Sollius Apollinaris Modestus Sidonius*, was born in the province of Gallia Lugdunensis, A.D. 428. His works consist of several poems, chiefly panegyrics and epithalamia, and nine books of epistles, which possess some historical value; but the style and language of his prose, as well as poetry, bear evident traces of the decline of the Latin language. Sidonius lived, as appears from his epistles, on intimate terms with Theodoric, king of the Visigoths; and he was the son-in-law of the Emperor Avitus. Sidonius was made bishop of Arverni (Clermont) in A.D. 473, and died in 484.

The first edition of Sidonius was printed at Lyon in 1552. The best editions are by Sirmondus, Paris, 1614, 4to., and Labbeus, Paris, 1652, 4to.

SIEGE is the process of advancing towards a fortress under the cover of earth thrown up from trenches excavated in the ground; silencing its fire by a superior fire of artillery and musketry; and finally, by breaching the ramparts, either obliging the defenders to surrender, or forcing an entrance into the place.

In commencing operations, the engineers trace on the ground, by means of pickets driven into it and connected by tapes, the direction of the first parallel trench, which is generally everywhere about 600 yards from the advanced parts of the covered way. This parallel usually extends along the fronts attacked, and so far beyond as to embrace the prolongations of all the ramparts, a fire from which might be directed against the works of the besiegers: it should terminate at each extremity, if possible, in some natural obstacles, as a morass or a river; and if no such obstacle exists, a redoubt may be raised there, in order, by its fire, to oppose any attempt of the enemy to turn the parallel. The trench is executed in the night-time by working-parties of men, who are protected by a guard of troops, usually about 50 yards in front of the tracing line; and these hold themselves in readiness to repel any sortie which may be made from the place. The earth obtained from the trench is thrown towards the fortress, in order to form a breastwork, which is about 3 feet high: all the trenches are from 10 to 18 feet wide, about 3 feet deep, and they have in general the same height of parapet.

The uses of this and any other parallel trench are to connect the lines of approach by a covered line of communication, and to serve as a line of countervallation in confining the garrison of the place. As soon as the first parallel is finished, the guard of the trenches is moved into it, for the purpose of protecting the succeeding operations.

The trenches leading from the first parallel towards the bastions and ravelins, which are the immediate objects of attack, are formed in zig-zag or oblique directions, and the several branches, if produced, should fall on the exterior of all the works of the place that they may not be enfiladed. The first oblique *boyeau* (branch) of the trench may be defended by the fire of the parallel; but the others are protected by the fire of troops stationed in small trenches, called parallel boyeaux, at the nearest angles between the several branches.

When the heads of the trenches have arrived within 300 yards of the covered-way, which is usually about the fourth night from the time of opening the trenches, a second parallel trench is formed, in order to facilitate the communication between the several lines of approach. It is executed by flying sap [SAP], that the men may be quickly protected from the fire of musketry in the covered way, which might now begin to take effect. In this parallel, if not previously constructed, may be formed the batteries which are to enfilade the ramparts by a ricochetting fire [BATTERY; RICOCHET], in order to dismount the guns and drive the defenders from the parapets.

After the fire from those batteries has partly silenced that of the place, the trenches of communication are continued in zig-zag directions as before; they may be executed by full sap [SAP], while the fire of the besieged continues in activity; but when that fire becomes relaxed, the opportunity may be seized of carrying on some part of the approaches in a more expeditious manner. About half-way between the second parallel and the foot of the glacis, a short parallel trench, terminated by a battery for howitzers, may be carried out; the howitzers being intended to enfilade the covered-way with shells, and thus destroy the palisades and traverses; and as soon

as the fires from the howitzers have produced some effect, the oblique trenches may be continued till they arrive at the foot of the glacis, in front of each of the works attacked.

A third parallel trench may now be executed to connect the points of attack at the foot of the glacis; and, for the protection of the troops, the crest of its parapet should be furnished with sand-bags disposed so as to leave between them small intervals (loop-holes) to fire through. It is estimated that the third parallel may be finished by about the tenth night from the time of opening the trenches.

At this period an assault may be attempted, by main force, with a view of driving the defenders out of the advanced parts of the covered-way, and crowning the glacis with batteries for breaching the works: such assaults are however always attended with considerable loss, and therefore, if time permits, it is preferred to continue carrying on the approaches by sap. For this purpose oblique trenches, or direct trenches protected by traverses, are carried up the glacis towards the salient points of the bastions or ravelins attacked; and when these arrive at between 30 and 40 yards from the crest at the angle of the glacis, high breastworks, called trench cavaliers, are formed, to allow a plunging fire of musketry to be directed into the covered-way. Instead of these, there are now formed batteries armed with small mortars from which balls or stones may be projected into the covered-way, in order to compel the defenders to retire.

After the fire from the cavaliers or mortar-batteries has obliged the enemy to abandon the advanced parts of the covered-way, trenches are continued towards the salient angle of the glacis, and when they have arrived near that angle, the crowning of the glacis commences. This is performed by extending the trench along the crest on each side of the angle, and throwing up the earth towards the place. A portion of a fourth parallel is sometimes carried out, that troops placed there may protect the sappers during the formation of the batteries, and the artillerymen during the operation of breaching the works.

The lodgments formed by the besiegers along the crest of the glacis are furnished with artillery, partly to serve as counter-batteries, whose use is to ruin the parapet and dismount the guns in the faces or flanks of the collateral works, in order as much as possible to prevent the enemy from opposing by musketry or artillery the passage which is to be effected across the ditch; and partly to form breaches in the ramparts of the works attacked. [Breach.] The crowning batteries on the glacis are supposed to be finished about the sixteenth night from the time of opening of the trenches.

While the breaches are being formed, the passages by which the descents into the ditches of the ravelins are to take place are commenced. These are either open trenches or subterranean galleries cut in inclined planes through or under the covered-way opposite the breaches. If the ditch is dry, the trenches are continued partly across the ditch; if wet, either solid causeways or floating bridges are formed in order to enable the troops to pass over.

The works are then stormed by troops, who mount the breaches and keep the defenders engaged, while sappers execute lodgments on the ascent; into these, when finished, the assailants retire, and thence direct a fire towards the heads of the breaches. From these lodgments trenches are carried on by sap to the top, and thence turning to the right and left they are continued about half-way down the faces of the works.

If the ravelins have considerable saliency relatively to the bastions, two ravelins may be taken in the manner just described, the approaches to the intermediate bastion being postponed in order to avoid the reverse fire of those ravelins on the ground: if the ravelins have reduits, these also may be breached, either by artillery in the lodgments of the ravelins, or by mining, and afterwards stormed, when the defenders will be obliged to abandon the whole of the two ravelins and the reduits, if there be such, in the re-entering places of arms. The approaches towards the bastions may then be recommenced; and, on the trenches arriving at the crest of its glacis, counter and breaching batteries may be constructed there. A breach being effected as before, the passage of the ditch and the assault of the bastion may take place; and, unless the bastion is strongly retrenched, it may be expected that the place will now be surrendered. It is estimated that the assault of the bastion may take place about the twenty-sixth night from the time of opening the trenches; but a good retrenchment in a bastion may enable the defenders to hold out ten or twelve days longer. [Retrenchment.]

A siege conducted according to the rules of art will be attended with comparatively small loss to the besiegers or besieged, the troops of both parties being but little exposed to each other's fire except at the times when the assaults are made on the ravelins or bastions. The want of time and means to carry on the approaches as far as the covered-ways was the cause of the great losses sustained in getting possession of the fortresses garrisoned by the French in Spain during the Peninsular War. The breaches in the walls of Badajos (1812) were made by guns in batteries at the distance of 500 yards; and when the assailing troops had descended into the ditch, being ignorant of the positions of the breaches, they took wrong directions, or remained to be slaughtered till the order was given to retire. The effort would have entirely failed, but for the success of Major-General Picton in escalading the walls of the castle, and of General Walker in escalading the bastion of San Vincente.

END OF VOL. X.

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